METHODS USED IN DEVELOPING INPUT-OUTPUT TABLES FOR THE PROVIDENCE STANDARD METROPOLITAN STATISTICAL AREA 1963 VOLUME I

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Institute for Defense Analyses
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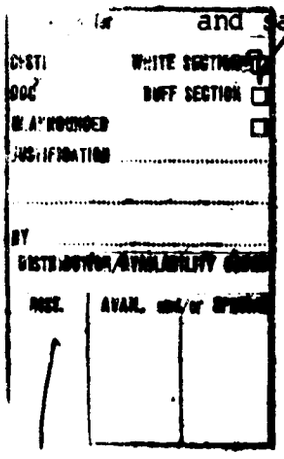

METHODS USED IN DEVELOPING INPUT-OUTPUT TABLES FOR THE PROVIDENCE STANDARD METROPOLITAN STATISTICAL AREA, 1963

by Caleb A. Smith

FOREWORD

This study was made by the Department of Economics, Brown University for the Institute for Defense Analyses under Subcontract OCD 138-8.

The end-product of the study is a series of input-output matrices published in IDA Research Paper P-394, Economic Relationships in the Providence, Rhole Island, Metropolitan Area. The material presented here is essentially a working paper which describes the methods used in developing the input-output tables. It is being distributed in this form because it is felt that this material will be of interest to those studying input-output analysis and may serve as a "textbook" showing how such tables can be compiled. The two volumes of this Internal Note have not been edited by IDA, except for a few modifications in format, and are presented as received from the Brown University group.

The sections of the report on the estimation of output in the Standard Metropolitan Statistical Area for sectors 68, 70 and 71 were prepared by Margaret Gardner and the section on personal consumption expenditure by Michael Waldman, both under the general direction of Dr. Smith. Analytical assistance was provided at various times by Dr. Alan R. Plotnick, George Lampl and Enamidem Ubok-Udom. Assistance in the preparation of the survey questionnaires was rendered by Theresa Tobin. The report was typed by Barbara Frost and Marion Anthony.

Thanks are due to Jack Faucett, John L. Preston and John M. Rodgers, all of Jack Faucett Associates, for sharing methods developed in their studies and in providing special information they developed or obtained for us from the Office of Business Economics or the Bureau of the Census.

Without the cooperation of the many business firms which responded to our detailed questionnaire the study would not have been possible. Thanks are due to Elwood Leonard, President, and Max Hatch, Executive Secretary of the Pawtucket-Blackstone Valley Chamber of Commerce, to John Stiness of the Greater Providence Chamber of Commerce, to William Ward of the Attleboro Chamber of Commerce and to James Winn of the Woonsocket Chamber of Commerce for their support in requesting response to the questionnaires. We are also grateful to Adolph T. Schmidt, Executive Director and the late Judd Brown, Research Director of the Rhode Island Development Council and T. W. Schulenberg of the Department of Commerce and Development of the Commonwealth of Massachusetts for their endorsement of our project.

The most sincere thanks are also due to Dr. Walter Isard for giving us the table of coefficients for the Philadelphia Area and permitting our use of them in this study.

I

INTRODUCTION

This study details the interindustry relations in the Providence-Pawtucket-Warwick, Rhode Island-Massachusetts, Standard Metropolitan Statistical Area (SMSA) for the year 1963 in the form of two input-output tables. The first shows transactions between enterprises within the SMSA. The second shows, in the same producing and consuming sector detail, the imports into the SMSA. Both tables have the same sectors as the table produced and published by the Office of Business Economics, U. S. Department of Commerce (Survey of Current Business, September, 1965) and as far as possible both are conceptually and statistically consistent with that table.

Our study of the Providence SMSA and a similar unpublished study of the New Orleans SMSA ("Interindustry Relations in the New Orleans Economy, 1963," by Jack Faucett Associates, Inc., Silver Spring, Maryland) were undertaken as separate subcontracts from the Institute For Defense Analyses under a contract from the Office of Civilian Defense. Every attempt has been made to keep the two tables conceptually and statistically consistent.

In the case of Providence, the use of the Standard Metropolitan Statistical Area posed many problems, because much data is available for the State of Rhode Island which is not available for the SMSA. At the outset the possibility of using the State of Rhode Island data was considered, but was soon abandoned because of the inter-relation of this study with other studies.

The superiority of state to SMSA data is uniquely great in the case of Providence because the high degree of overlap[1] leads to more

1. The State of Rhode Island had a population in 1960 of 859,488, of which 731,358 (85.2 percent) were in the Providence SMSA. In

suppression of information to avoid disclosure than usual. In common with other New England SMSA's the boundaries do not follow county lines (see Figure 1). In the many cases when only county or state data was available the data for the SMSA had to be estimated on the basis of crude allocations of county data. Fortunately, this problem was most serious in nonmanufacturing, however, it also affected the determination of the control totals for the four-digit SIC industries in manufacturing, because the number of enterprises by size groups in each industry are published on a county rather than an SMSA basis. However, since control totals obtained from the Census on an SMSA basis were available for two- and three-digit aggregates of four-digit industries, errors introduced because of the necessity of breaking down county data affected only the allocation within these aggregates and not the overall totals.

This section discusses the detailed methods used and emphasizes the differences in sources or techniques from those used in the New Orleans study. The conventions developed in that study for the location of production of services, as well as the general practice of not transferring secondary output because of inability to identify it were followed in our study. No attempt will be made to present here the theory of input-output or the generally accepted practices employed in such studies.

The questionnaires used in Providence were developed jointly with

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addition, 89,743 persons (10.4 percent of the SMSA population) reside in one city and nine towns in Massachusetts within the 1963 boundaries of the SMSA.

The parts of Rhode Island outside the SMSA are all within one hour's driving time of downtown Providence and have substantial economic ties to Providence. The proportion of urban to rural areas in Rhode Island is more typical of the proportion in SMSA's of this size than for the Providence SMSA. On the other hand, the city of Attleboro, Massachusetts, and the nine Massachusetts towns in the SMSA are undoubtedly closely related to Providence and their exclusions would make the picture of the area incomplete.

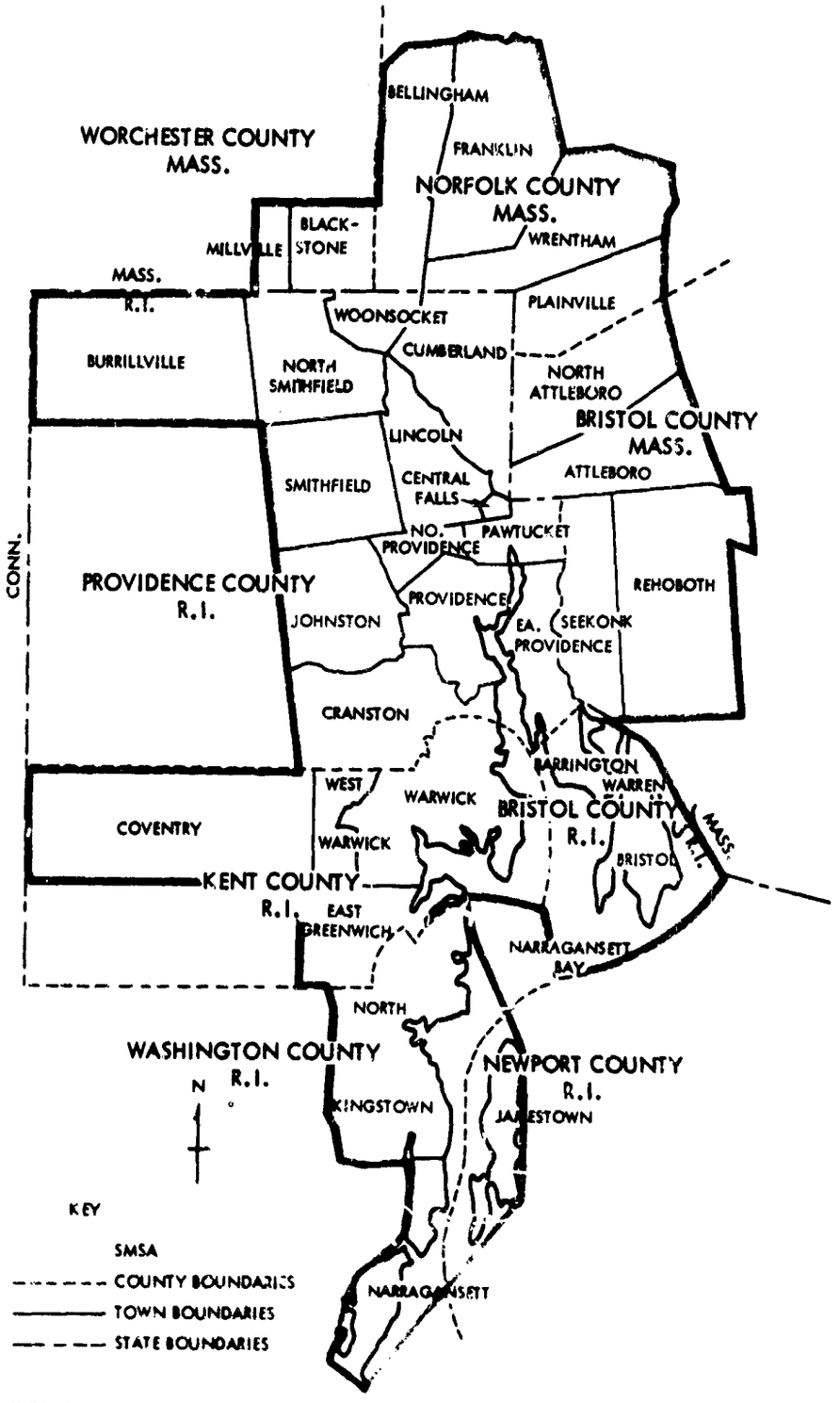

FIGURE 1 (U). Providence-Pawtucket-Warwick Standard Metropolitan Statistical Area (Rhode Island - Massachusetts) Showing County Boundaries

Jack Faucett Associates, and were the same as those used in New Orleans except for differences in typing and abbreviation. Our method of selecting the sample for distribution of the questionnaire was, however, quite different.

The Rhode Island Development Council's Directory of Manufacturers, 1965, noted 2,884 enterprises in the State, all but about 130 of them in the Providence SMSA. From the Council's list a carefully balanced sample of slightly over 400 was developed, including all enterprises listed as having over 100 employees, and in general, containing a preponderance of the larger enterprises. A similar list of about 70 enterprises in the Massachusetts part of the SMSA was developed from the Massachusetts Industrial Directory.

The original lists were scanned by staff of the Greater Providence Chamber of Commerce, the Pawtucket-Blackstone Valley Chamber of Commerce, the Woonsocket Chamber of Commerce and the Attleboro Chamber of Commerce. A few additions and deletions were made and in many cases the names of executives were supplied. Each chamber of commerce sent a letter to their members and supplied us with letters commending the study and urging cooperation, to send to other enterprises in their area. Similar letters from the Rhode Island Development Council and from the Massachusetts Department of Labor and Industries were sent with the questionnaire. The executives of the chambers of commerce assisted in the follow-up in particularly important cases.

The enterprises surveyed produce approximately 90 percent of the manufacturing output in the SMSA. After considerable telephone and personal follow-up 120 usable replies were obtained from manufacturing enterprises. Their reported sales of $832,561,000 was 40.0 percent of the value of shipments in the SMSA in 1963 ($2,083,813,000) as reported by the Bureau of the Census in a special tabulation.

Information obtained from these questionnaires, (samples are found in Appendix B) which included information on the inputs by I-O sector and the location inside or outside the SMSA of the supplier, was the mainstay of the study. Although respondents attempted to give figures on all inputs of significance, many minor inputs

which in the aggregate are not insignificant are probably omitted from most of the replies that form the basis of the study, e.g., lubricating oil. Since the replies constituted only a sample it was also essential to determine the output for each industry independently.

II

CONCEPTS AND SUMMARY OF PROCEDURES

A. MANUFACTURING SECTORS

1. Control Totals for the Manufacturing Sectors by Four-Digit SIC Industry

Separate output control totals were developed for each four-digit SIC industry represented in the Providence SMSA in order that input coefficients representative of the product mix of the SMSA could be developed. These control totals were developed by using the data on number of enterprises in each four-digit industry by size classes (based on number of employees) as published in the 1963 Census of Manufactures volume entitled Location of Manufacturing Plants by County, Industry, and Employment Size, Part I, New England Division.

The data for the three Rhode Island counties which constitute the major part of the SMSA were totaled and the remainder of the SMSA was analyzed using both the appropriate county figures and the information in the Massachusetts Industrial Directory, 1964-1965. Since plants are assigned in that directory to several four-digit industries it was necessary to produce an intermediate directory in which each plant in the relevant geographical area was assigned to a single industry. The data on number of plants by size groups for each four-digit industry was then used in conjunction with figures on the average shipments of all plants of each size group in the United States in each industry, which Jack Faucett Associates kindly supplied. The resulting figures were totaled for each four-digit industry to supply a preliminary estimate of shipments by that industry. These preliminary estimates of shipments were totaled for three- and two-digit industry groups and compared to total shipments figures

for these three- and two-digit industries obtained in a special compilation released by the Census Bureau. (One group of two-digit industries that are relatively unimportant in the Providence SMSA, comprising 6.1 percent of all establishments, was combined in the Census tabulation.)

The preliminary estimates of shipments were adjusted to conform to the Census totals, assuming that the differences were spread equally between all four-digit industries in the Census tabulation group. The adjusted totals were then grouped by I-O sectors and transformed into estimates of I-O output and consistent four-digit industry totals by applying the ratio found between I-O output in the 1958 OBE table and the shipments shown by the 1958 Census. These ratios were similar to the ones developed by Jack Faucett Associates and were checked against their ratios which we obtained after having computed our own. Although generally agreement was close, in a few cases we decided our work had been in error and changed it. Final estimates of output by four-digit industry shown in Table 1 enabled us to develop input and output coefficients which were weighted within each I-O sector more in accord with the true industrial mix of the Providence SMSA than would have been the result if the manufacturing sectors had not been disaggregated to the four-digit SIC level.

The validity of the output estimates for the various four-digit SIC levels depends, obviously, upon how well enterprises of a given employment size group from a particular four-digit SIC in the Providence SMSA are represented by the average shipments determined for enterprises of that employment size group from that four-digit SIC nationally. The validity of the total output for the most important three-digit SIC's and for the important two-digit SIC's is assured but the estimate for a particular four-digit SIC may be in considerable error. This is especially likely to be true if the estimate is based on the presence in the SMSA of only one or two enterprises from that four-digit SIC. An extreme case is SIC 2911--petroleum refining--with one enterprise employing 100-249 persons shown in the Census tabulation of location of plants. In this case,

however, a special study revealed that the estimated output of $21,091,500 was confirmed by the following calculations. By using employment data given for the Northeast and for the individual states it was possible to narrow the employment estimate to 100-134 persons. Output of all refineries in the United States employing 100-249 employees was $150,640 per employee. Output of all refineries in the Northeast was $169,010 per employee, while output of refineries producing 50-75 percent asphalt (probably the proportion for the Providence SMSA refinery) was $155,687 per employee. This gives an output estimate range of $15,064,000 to $22,647,000.

2. Determination of Input Coefficients

For those four-digit SIC industries for which we had usable questionnaire responses, the input coefficients for material inputs were determined directly. For the remaining four-digit SIC industries, coefficients were obtained from the Philadelphia Region Input-Output Study by Walter Isard, Thomas W. Langford, Jr. and Eliahu Romanoff. The coefficients found for the Philadelphia Region at the four-digit SIC level were deemed to be more similar, on the average, to coefficients that pertain in the Providence SMSA than national coefficients and hence were used in preference to ones developed from OBE worksheets. When the Philadelphia study showed unallocated material inputs for the SIC's used in any I-O sector of more than one-half of one percent of output of the sector (and often when the percentage was less than this) the unallocated inputs were allocated, after a study of the OBE table, on the basis of our knowledge of the character of the enterprises in the SMSA.

In a few cases a four-digit SIC for which we did not have survey information was not represented in the Philadelphia Region table. In most such cases the total material inputs for the other four-digit SIC's in the I-O were inflated to cover the missing SIC's. In some cases the coefficients in the 1958 input-output table published by the OBE were used, and in a few cases a single four-digit SIC or a group of SIC's smaller than the whole I-O sector was used as the

basis for the inflation. The source of data for the material inputs to each four-digit SIC is shown in Table 1.

For 73 of the four-digit SIC's represented in the Providence SMSA comprising 67.23 percent of the estimated output of the manufacturing sectors of the Providence SMSA, material inputs were estimated from survey data from one or more questionnaires obtained from establishments in the Providence SMSA which were classified in that four-digit SIC. The material inputs for four-digit SIC's comprising 30.02 percent of the output were developed from Philadelphia Region coefficients for the same four-digit SIC. Material inputs for four-digit SIC's comprising only 2.05 percent of the estimated output were obtained by inflating data for a broader group, usually all the rest of the I-O sector, while 0.70 percent were obtained from OBE coefficients which pertained to an entire I-O sector. The material inputs to the manufacturing sectors are, therefore, highly particularized to the four-digit SIC industry mix of the Providence SMSA. Variations in inputs for enterprises within any one four-digit SIC could, however, make the picture in the table somewhat unrealistic. This danger is typified by I-O sector 31. The sector is completely dominated by the single petroleum refinery in the Providence SMSA, having an estimated output $21,091,500 of the $22,631,600 estimated output of the sector. This refinery is not typical since it specializes in asphalt production, hence some of the input shown as crude petroleum (sector 8) may be, in reality, residual fuel oil (sector 31).

The division of inputs between those produced in the SMSA and those produced outside the SMSA is one of the special features of this input-output study and the similar study of the New Orleans SMSA by Jack Faucett Associates. The survey was especially directed toward obtaining a division of inputs on this basis. The questionnaire information obtained from all the enterprises in any I-O sector was used (after weighting for the importance of the four-digit SIC in the I-O sector) as the basis for allocating all similar inputs into the sector between those produced in the SMSA and those produced outside. For those I-O sectors for which no survey data was available (and for

inputs not shown on questionnaire but shown for four-digit SIC's covered by Philadelphia coefficients) inputs were allocated between those produced within the SMSA and those produced outside on the basis of the average composition of that input shown on all survey questionnaires.

The non-materials inputs to the manufacturing sectors, i.e. inputs from I-O sectors 65 through 86 were also determined largely from survey data and by elaboration and inflation of the survey data. The principal source of data to supplement the survey was the 1958 Input-Output Table prepared by the OBE rather than the coefficients of the Philadelphia Region Table. Because the similarity between establishments in the same four-digit SIC industry in Philadelphia and Providence was presumed to be less great for many non-material inputs than for material inputs, the use of Philadelphia coefficients was not regarded as especially helpful.

Questionnaire responses from manufacturing establishments covered inputs from I-O sectors 66 through 68, 70-75 and 81-83 in a way that was deemed satisfactory. For all I-O sectors for which survey data was available the survey information on these nonmaterial inputs was simply inflated to the sector control level and used. To obtain estimates for the remaining I-O sectors the coefficients from the published OBE table were applied to the sector control, and the breakdown between inputs from within the SMSA and from outside was obtained by using the average proportions found for the sectors for which survey data was available.

The inputs from I-O sector 65 shown on our questionnaires were considered unsatisfactory since many establishments showed no inbound transportation costs, and since returns from the trucking industry showed that only a very small part of inbound transportation charges were paid by local firms. Inputs from outside the SMSA shown on our questionnaire responses included transportation and warehousing charges. In order to bring these down to producer's cost (the conventional way of showing inputs in an input-output table) transportation margins had to be calculated. Transportation coefficients were

worked out from margins obtained from the 1958 Input-Output tape distributed by the OBE and published in a recent study.[1] This study showed margins for nine types of inputs received by twelve groups of industries. The transportation margin on survey inputs was calculated from these margins. The calculated margin was subtracted as one step in obtaining producer's cost. It was also summed for all inputs shown on questionnaires and inflated to four-digit SIC control levels and then to I-O sector control levels to obtain the input from sector 65. The transportation charges calculated in this way are sometimes greater than and sometimes less than the charges that would be obtained if sector coefficients from the OBE table were applied to sector control totals. For I-O sectors for which no questionnaire data was available this latter method was used. The results, however, are not particular to the inputs for the four-digit SIC's represented in the questionnaires and hence are deemed inferior.

Sector 69, wholesale and retail trade, could not be analyzed for inputs on the basis of direct inquiry since this would require knowledge by the receiver of his supplier's cost of doing business. The questionnaire did, however, ask whether inputs were obtained from the producer or from wholesalers or retailers located in the Providence SMSA. Inputs shown as coming from wholesalers or retailers were separately compiled and margins (derived from data on margins of merchant wholesalers published as a special study in the 1963 Census of Business) removed in the same way as transportation margins were removed. The total of these margins, adjusted to four-digit SIC and then to I-O sector control totals, was used (when available) as the input from sector 69 in preference to a figure developed from the OBE coefficient. The latter, however, was used for sectors for which no

1. Karen R. Polenske, Study of Transportation Requirements Using National and Multiregional Input-Output Techniques, Clearinghouse, April, 1967), pp. 5 and 13.

questionnaire information was available. Inputs from wholesalers or retailers outside the SMSA were not covered separately in the survey and were shown along with all other purchases outside the SMSA.

Since almost all purchases by wholesalers were from producers outside the SMSA, all purchases by businesses from wholesalers or retailers were assigned to producers outside the SMSA after deflating for trade margins.

Division of inputs between those produced in the SMSA and those produced outside from sectors 76-79 could not be achieved on the basis of survey results. With a few exceptions it is unlikely that inputs imported from these sectors are of importance. No inputs from these sectors were assigned to imports unless there was evidence of such an import.

B. NON-MANUFACTURING SECTORS

The output of each non-manufacturing sector was determined carefully relying on census and other published information and comparing national totals for 1958 developed by the same methods with the totals we developed for the Providence SMSA. The procedures are discussed in detail in separate sections following this general discussion.[2]

In an attempt to develop local input coefficients detailed files of names and addresses of establishments in the transportation, wholesale trade, and construction industries were prepared and questionnaires mailed to about 1200 wholesalers, 1600 contractors and almost 200 firms in the transportation industry. There were thirty usable replies from the construction industry; the way in which they were used is outlined in the special sections on I-O sector 11 and I-O sector 12.

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2. We were guided by the work of John M. Rodgers, et. al., in their 1963 Output Measures for Input-Output Sectors by Standard Metropolitan Statistical Areas and Non-Metropolitan State Areas (Jack Faucett Associates, December, 1966, for the Institute for Defense Analyses), but often found it necessary to use additional or other sources of information. We checked our results against Rodgers' figures and usually found reasonable agreement, although he regarded his Providence figures as probably the least reliable of those for any SMSA in the country because of the failures of the SMSA to follow county lines combined with its overlap of the state boundary.

The very poor quality of most replies as well as the extremely slight response in the case of wholesale trade and transportation (other than by air) made it necessary to rely on national figures to estimate inputs for these sectors.

Special studies were made of the largest electric and the largest gas utility in the SMSA and this data was used to supplement national coefficients in estimating inputs to these industries. In all other cases national coefficients were relied upon for determining inputs. The divisions of inputs between producers within the SMSA and those outside were estimated by using the ratio for each input found on the manufacturing questionnaires, except in a few instances when the source could be directly determined, e.g., natural gas purchases by the utility industry.

C. TRANSFERS

Insufficient evidence of secondary output was obtained on the questionnaires so no transfers were made for the material output sectors 1-64. Transfers were made as follows:

To I-O 68 from I-O 79 Amount $9,204,000	The value of output by municipal utilities in table for sector 68.
To I-O 73 from I-O 26 Amount $25,023,000	An estimate of output of newspaper and direct mail advertising made by taking the percentage of the output less transfers of OBE table which was shown on their transfer matrix as a transfer to I-O 73. This percentage was applied to the output of I-O 26 in the Providence SMSA.
To I-O 73 from I-O 66 Amount $2,141,000	An estimate of telephone directory advertising made by applying the percentage of the output of New England Telephone and Telegraph assigned to the Providence SMSA (see table for sector 66) to the directory advertising reported in the FCC Statistics, 1963.

To I-O 73 from I-O 67 Amount $10,099,000	The entire output of I-O 67.
To I-O 81 from all sectors Amounts as in matrix	Estimates developed by applying the 1958 OBE coefficients to outputs determined from row totals.
To I-O 82 from all sectors Amounts as in matrix (all inputs are transfers).	Same as above.

D. FINAL DEMAND

1. Estimated Personal Consumption Expenditures

The estimation of Personal Consumption Expenditures (PCE) for the Providence SMSA actually consists of two distinct parts. First, it was necessary to estimate disposable personal income. This was accomplished by multiplying the figure for disposable personal income for the entire state of Rhode Island by the ratio of the SMSA population to the state population. Since the data for Rhode Island disposable income was not available from the OBE for 1965, this figure was estimated by determining from past data what percentage disposable personal income is of total personal income.[3] The data for disposable personal income for Rhode Island for the other years were obtained from the April issues of the Survey of Current Business.

It was also necessary to either estimate or modify the figures for state and SMSA population used in the above computations. The 1960 figure for SMSA population was obtained from the 1960 Census data directly and was not modified. However, the 1960 figure for state population was modified to exclude the 10,000 naval personnel on board ships in the area of Newport, Middletown, and North Kingston who were included by the Bureau of the Census. The 1965 state population figure was obtained from the Special Census of Rhode Island and

3. The average percentage for the years 1961-1963 (87.0 percent) was used for this purpose. The past data for disposable personal income (expressed as a percent of total personal income) were not consistent enough with comparable data for the United States as a whole to warrant the use of the percentage figure for the United States in 1965 to estimate the Rhode Island figure for 1965.

has not been modified since naval personnel on board ships were not included in the 1965 Census. The 1965 SMSA population figure was obtained in two parts: the Rhode Island section of the SMSA was obtained from the Special Census, the Massachusetts section of the SMSA was obtained by attributing to it the same rate of growth as the Rhode Island section from 1960 to 1965 and also by adding the population figure for Rehoboth, Massachusetts, to the Massachusetts SMSA population figure for 1965. The state and SMSA population figures for the years 1961-1964 were obtained by a straight-line projection of the data from 1960 to 1965.

The SMSA estimated PCE was then obtained by multiplying the SMSA estimated disposable personal income by the ratio of the US PCE to the US disposable personal income. The data for the United States were obtained from the July and August issues of the Survey of Current Business and have not been modified. For the years 1960-1961, the average estimated PCE for the Providence SMSA was $1,480 million. Another estimate was made using data in the BLS Survey of Consumer Expenditure, 1960-61. This gave an estimate of $1,770 million for PCE in the Providence SMSA for 1960-1961. However, according to the United States Census, the average population per household in the Providence SMSA for 1960-1961 is 3.29, which is larger than the figure quoted by the BLS (3.1) as the average for all SMSA's in the Northeastern Region. Using this figure, we get the following results for our estimate of PCE for 1960-1961:

$6,414.74	Average PCE per household (all SMSA's)
3.29	Average population per household (Providence SMSA)
249.1	Number of households (Providence SMSA)
$1,598 million	Estimated PCE (Providence SMSA)

The figure obtained from the BLS data is thus $118 million larger than the figure we had obtained by the estimating procedure described in the first part of this paper. Therefore we now have the problem

of deciding which estimate to use for PCE: $1,598 million or $1,480 million.[4]

In order to help solve this problem, we hypothesized that the per capita disposable personal income for Providence SMSA was not appreciably different from that of the state of Rhode Island as a whole then, PCE for the Providence SMSA was estimated as follows:

$$\text{PCE} = \text{R.I. per capita disposable personal income} \times \frac{\text{Average population per household in Rhode Island}}{\text{Average population per household in Providence-Pawtucket SMSA}} \times$$

$$\text{Population of Providence-Pawtucket SMSA} \times \frac{\text{US personal consumption expenditures}}{\text{US disposable personal income}}$$

The data and results for 1960-61 were as follows:

$1935.50	Rhode Island per capita disposable personal income.
3.34	Average population per household in Rhode Island.
819.5	Population of Providence SMSA.
.924	US personal consumption Expend/US disposable personal income.
$1,488 million	Estimated PCE for Providence SMSA.

This estimate corresponds very closely to the first estimate of $1,480 million. Further support for the reliability of the estimate of $1,480 million was obtained from data found in Sales Management, Annual Survey of Buying Power, 1961-1962. When we adjusted that figure for net cash income (which corresponds fairly closely to PCE), we obtained an estimate of $1,487 million. In addition, an estimate of PCE for Providence SMSA based upon "Effective Buying Power" data obtained from Sales Management was calculated to be $1,490 million. It was therefore decided that the best estimate was $1,480 million.

4. In either case, of course, the relative distribution among the various categories of PCE and among the 87 industries will remain the same.

A portion of what is regarded as personal consumption expenditure in studies of PCE is not part of final demand in the input-output sense. Out of the average personal consumption expenditure of a family in an SMSA in the Northeast ($6,694.70) the amount not so regarded is $399.97, leaving a balance of $6,294.73 per family to allocate to the various I-O categories. Since the estimate of $1,480 million includes these expenditures it was necessary to make a reduction of 5.974 percent to $1,390 million for the final demand estimate.

For the input-output study it was necessary to compile a breakdown of PCE according to the 87 different industries. This was accomplished as follows: First, detailed data of consumption expenditures for the Northeastern Region of the United States was obtained.[5] Since no detailed data for the Providence SMSA was available, it was decided to use the data for the average expenditures per household of all SMSA's in the Northeastern Region as an approximation for this unavailable data.

The data for the average of all SMSA's were first compiled using the PCE categories normally used in the national income accounts. These categories were then classified into the 87 input-output industries.[6] As noted above it was necessary to modify the data for PCE. Life insurance expenditures were adjusted to conform to the definitions used in compiling I-O 70 in the input-output study. The necessary data for this was obtained from the Life Insurance Fact Books for 1961 and 1962. A further modification to exclude gifts to persons was also necessary.

2. Government Purchases

Expenditure by the governments of Rhode Island and Massachusetts in the Providence SMSA were not available. State expenditures tend

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5. Survey of Consumer Expenditures, 1960-1961: Consumer Expenditures and Income, Total Northeastern Region (Supplement 3, Part A, to BLS report 237-89, May, 1966).

6. Outlined in an article by Nancy W. Simson, Survey of Current Business, (October 1965).

to be concentrated in the capital city, especially in a small state. The population of the SMSA is 95.53 percent of that of the State of Rhode Island. It seemed reasonable to estimate expenditures in the SMSA by the two state governments at 98 percent of the entire general expenditure by Rhode Island.

Expenditure by the local governments was available for the four largest cities, Providence, Pawtucket, Cranston, and Warwick, which have slightly over one-half the population of the SMSA. Since per capita expenditure in Cranston and Warwick, which are predominantly suburban, averaged about the same as the Providence-Pawtucket average, it seemed reasonable to estimate total local government expenditure on the basis of the per capita in the four cities.

Expenditure by the Federal Government on general public administration was estimated by using information on numbers of persons employed and median earnings from the 1960 population census. The ratio between an index of earnings of persons in the SMSA employed in federal public administration and the index for persons employed in state and local public administration was applied to the estimates of state and local expenditure.

General government non capital expenditures for the Providence SMSA in 1963 were estimated as follows:

State governments	$123,835,000
Local governments	125,779,000
Federal Government	106,497,000
Total	356,111,000

Expenditures on new construction were reported for the state governments but only total capital outlay was reported for the local governments so the state ratio was applied. For Rhode Island 74.67 percent of the reported capital outlay was for construction. Federal Government purchases of new construction were estimated by using the ratio of such purchases to state and local government purchases in the 1958 national I-O table. The general government construction

expenditures in the Providence SMSA for 1963 were estimated as follows:

State governments	$30,460,000
Local governments	21,472,000
Federal Government	14,578,000

Inputs, other than from new construction, to state and local government and local Federal Government were determined by using coefficients derived from the 1958 national OBE table data on purchases by the state and local governments. It was felt that general Federal Government activities in the Providence SMSA were more comparable to state and local activities than to Federal Government activities nationally, so the same input pattern was used.

The resulting estimates for the repair and maintenance construction input to both the State and local and the Federal Government appeared to be excessive when related to repair and maintenance construction used as intermediate inputs and total output of repair and maintenance construction. On the other hand, the contribution of new construction to gross private fixed capital obtained by difference was far in excess of the estimate of total plant derived from the BLS capital flow matrix. Considering the difficulty in distinguishing these two activities it seemed likely that failure to classify construction activity properly was a major source of the errors. Consequently $10,739,000 was transferred from repair and maintenance construction expenditures by the state and local government and $6,000,000 from such expenditures by the Federal Government and added to their purchases of new construction.

3. Gross Private Fixed Capital Formation

The responses on the survey questionnaires were too sketchy to form a basis for estimating such expenditures; moreover they did not specify the sort of equipment purchased. The Census of Manufactures reports capital expenditures (new) by two- and three-digit industry classification for the Providence SMSA; a total of $47,821,000 is recorded. Capital expenditures for SIC major industry groups 21,

24, 25, 29 and 37, which amounted to a total of $1,755,000 or 3.7 percent of the amount for all manufacturing industries, is not specified between groups because of disclosure. These industry groups are all relatively unimportant in the SMSA. We had already estimated that shipments for them totaled 3.7 percent of the shipments of all manufacturers in the SMSA. Capital expenditures for each of these groups were estimated in proportion to their estimated shipments.

Total gross private fixed capital formation as shown in the 1958 OBE input-output table was $62,392,000,000. In a preliminary matrix showing capital flows prepared recently by the Division of Economic Growth of the U.S. Bureau of Labor Statistics to complement the 1958 OBE input-output table, 22.9 percent of the capital flow is shown as consumed by the manufacturing sectors (13-64). If this percentage figure is applied to the total of $62,392,000,000, a flow of $14,288,000,000 is attributed to manufacturing. This compares with $9,544,000,000 as the capital expenditures (new) reported by the Census of Manufactures for 1958 in the 1963 publication of the data. If the ratio of underreporting is assumed to be the same in each manufacturing industry in the Providence SMSA in 1963, as it was in all manufacturing in the United States in 1958, we can apply a factor of 1.497066 to the capital expenditures reported by the Census to get estimates for the manufacturing sector.

For the nonmanufacturing sectors estimates were developed by applying the ratio of output to capital flow shown for the sector for 1958 to the output already estimated for each sector for the Providence SMSA in 1963. The estimate of capital flows by I-O consuming sector obtained in this way has the merit of making it possible to develop the estimates of capital flows by producing sectors, needed for the input-output matrix, which take into account the industrial mix in the Providence SMSA. For instance, using this technique no coal or metal mining or oil drilling equipment will be attributed to the capital formation in the Providence SMSA.

Capital flows by producing sector as shown in the BLS matrix were used in conjunction with the estimates of capital flows by

consuming sector developed above to estimate the proportion of the output of the various I-O sectors which went to gross private fixed capital formation.

Table 1

CONTROL TOTALS BY FOUR-DIGIT SIC AND BY I-O SECTOR
AND SOURCE OF INPUT COEFFICIENTS BY FOUR-DIGIT SICs

I-O Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients[a]
13	Not represented in SMSA			
14	152,143.7	2011	2,740.2	Phila.
		2013	1,960.2	Survey (1)
		2015	4,913.4	Phila.
		2021	406.5	Infl. T
		2024	5,372.0	Phila.
		2026	39,367.7	Survey (1)
		2032	159.8	Phila.
		2033	973.9	Phila.
		2036	1,150.2	Phila.
		2041	420.0	Phila.
		2042	2,303.1	Phila.
		2045	140.1	Phila.
		2051	33,923.5	Survey (2)
		2052	741.0	Phila.
		2071	7,995.8	Phila.
		2082	23,938.1	Phila.
		2086	8,505.1	Phila.
		2087	3,604.1	Phila.
		2094	2,455.1	Phila.
		2096	3,221.1	Phila.
		2097	297.2	Phila.
		2098	1,007.5	Infl. T
		2099	6,548.2	Survey (2)
15	27.8	2121	27.8	Phila.

a. Survey (x) indicates inputs estimated from survey questionnaires covering (x) establishments.

Phila. indicates inputs estimated from coefficients in Philadelphia region table prepared by Isard, et. al.

OBE indicates inputs estimated from coefficients in 1958 input-output table prepared by OBE.

Infl. T indicates inputs estimated by inflating inputs determined for remainder of IO sector.

Infl. P indicates inputs estimated by inflating inputs for 1-digit SICs for which Philadelphia coefficients were used.

Infl. * indicates inputs estimated by using Philadelphia coefficients for SIC 3321.

Infl. ** indicates inputs estimated by using coefficients developed from survey data on SIC 3356.

Table 1 (Cont'd)

IO Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
16	291,554.9	2211	10,186.9	Survey (3)
		2221	53,802.7	Survey (3)
		2231	28,112.2	Survey (4)
		2241	47,552.9	Survey (3)
		2261	46,153.8	Survey (2)
		2262	10,226.0	Survey (1)
		2269	13,294.8	Phila.
		2281	6,607.0	Survey (1)
		2282	11,717.0	Phila.
		2283	51,906.9	Survey (4)
		2284	12,194.7	Phila.
17	39,994.4	2271	596.0	Phila.
		2272	331.3	Phila.
		2279	5,603.1	Phila.
		2291	3,061.3	Phila.
		2292	7,532.5	Survey (2)
		2293	1,701.8	Survey (1)
		2294	1,910.7	Phila.
		2295	7,343.1	Survey (2)
		2297	11,133.5	Survey (2)
		2298	553.9	Phila.
		2299	227.2	Phila.
18	66,108.9	2251	84.2	Phila.
		2253	1,891.0	Phila.
		2256	26,603.1	Survey (1)
		2259	377.8	Phila.
		2311	4,217.3	Phila.
		2327	300.1	Survey (1)
		2328	1,169.6	Survey (1)
		2329	1,198.0	Survey (1)
		2331	1,173.6	Phila.
		2335	9,647.3	Phila.
		2337	758.3	Phila.
		2339	186.7	Phila.
		2341	4,655.6	Phila.
		2342	260.5	Phila.
		2351	94.5	Phila.
		2361	1,119.6	Phila.
		2363	293.1	Phila.
		2369	6,205.1	Phila.
		2384	953.3	Phila.
		2385	1,656.5	Phila.
		2387	130.6	Phila.
		2389	3,133.1	Phila.
19	4,637.2	2391	2,145.7	Phila.

Table 1 (Cont'd)

IO Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
		2392	628.6	Phila.
		2394	883.4	Phila.
		2395	54.2	Phila.
		2399	925.3	Survey (1)
20	7,920.9	2411	45.2	Infl. T
		2421	250.5	Phila.
		2426	68.5	Infl. T
		2429	75.4	Infl. T
		2431	3,012.0	Phila.
		2433	815.8	Phila.
		2499	3,653.5	Infl. T
21	294.5	2441	221.9	Phila.
		2442	72.6	Infl. T
22	1,585.4	2511	253.0	Phila.
		2512	379.6	Phila.
		2514	99.8	Phila.
		2515	853.0	Phila.
23	10,440.2	2522	82.8	Phila.
		2541	5,090.3	Phila.
		2542	95.0	Phila.
		2591	5,172.1	Phila.
24	33,386.6	2631	10,119.4	Phila.
		2641	8,733.6	Survey (2)
		2642	79.1	Phila.
		2643	1,606.1	Survey (1)
		2645	2,597.5	Phila.
		2649	6,602.2	Infl. P
		2661	3,648.7	Phila.
25	26,010.4	2651	5,419.7	Phila.
		2652	5,173.2	Phila.
		2653	2,179.5	Phila.
		2654	7,120.4	Phila.
		2655	6,117.6	Phila.
26	57,776.1	2711	22,461.3	Survey (2)
		2721	246.0	Phila.
		2731	400.2	Phila.
		2732	3,973.0	Phila.
		2741	407.1	Survey (1)
		2751	12,317.8	Survey (1)
		2752	8,166.2	Survey (2)
		2753	1,136.7	Phila.
		2761	680.5	Phila.
		2771	2,899.2	Survey (1)
		2782	521.3	Phila.
		2789	794.5	Phila.

Table 1 (Cont'd)

I-O Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
		2791	1,193.6	Phila.
		2793	2,578.7	Phila.
27	41,289.3	2812	2,145.7	Infl. T
		2813	359.9	Phila.
		2815	17,972.7	Phila.
		2816	2,488.3	Phila.
		2818	10,074.6	Survey (1)
		2819	4,478.7	Phila.
		2861	102.0	Phila.
		2872	687.1	Infl. T
		2891	403.9	Phila.
		2899	2,576.4	Phila.
28	30,994.2	2821	30,244.7	Survey (3)
		2824	749.5	Infl. T
29	10,283.2	2833	170.7	Phila.
		2834	290.2	Phila.
		2841	3,594.8	Phila.
		2842	277.8	Phila.
		2843	5,949.7	Phila.
		2844	--	Survey (1)
30	11,825.6	2851	11,825.6	Survey (1)
31	22,631.6	2911	21,091.5	Phila.
		2951	990.1	Phila.
		2992	550.0	Phila.
32	130,333.9	3021	46,891.1	Survey (1)
		3069	55,672.3	Survey (1)
		3079	27,770.5	Survey (2)
33	3,188.9	3111	2,797.7	Phila.
		3121	391.2	Phila.
34	20,785.5	3131	4,669.1	Phila.
		3142	985.6	Phila.
		3161	8,428.5	Survey (1)
		3172	5,911.0	Survey (1)
		3199	791.3	Phila.
35	14,038.8	3229	12,496.0	Survey (1)
		3231	1,542.8	Phila.
36	13,553.2	3264	35.7	Infl. T
		3269	32.3	Phila.
		3271	1,208.5	Phila.
		3272	3,114.0	Survey (1)
		3273	5,091.6	Phila.
		3281	691.2	Survey (1)
		3291	2,764.0	Phila.
		3295	615.9	Phila.
37	34,993.0	3312	18,197.5	Phila.
		3315	14,555.2	Phila.

Table 1 (Cont'd)

I-O Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
		3316	11,868.5	Phila.
		3321	4,696.3	Phila.
		3322	1,384.0	Infl. *
		3391	1,540.0	Survey (1)
		3399	2,751.5	Infl. T
38	215,813.0	3339	8,552.4	Infl. **
		3341	4,810.3	Phila.
		3351	29,241.5	Survey (1)
		3352	1,515.0	Phila.
		3356	63,186.6	Survey (3)
		3357	105,263.2	Survey (7)
		3361	1,105.4	Phila.
		3362	1,374.1	Phila.
		3369	764.5	Phila.
39	Not represented in SMSA			
40	35,753.8	3432	139.5	Phila.
		3433	2,083.7	Phila.
		3441	7,632.3	Phila.
		3442	10,997.7	Phila.
		3443	4,536.0	Phila.
		3444	7,660.5	Phila.
		3446	707.6	Survey (1)
		3449	1,996.5	Survey (1)
41	38,044.7	3451	8,552.0	Survey (1)
		3452	15,665.0	Phila.
		3461	13,827.7	Survey (1)
42	65,642.6	3421	10,138.7	Survey (1)
		3423	1,270.2	Phila.
		3429	1,071.4	Phila.
		3471	4,358.7	Survey (1)
		3479	12,128.0	Survey (1)
		3481	2,537.8	Phila.
		3494	24,458.1	Survey (4)
		3496	445.1	Phila.
		3498	653.6	Phila.
		3499	8,581.0	Survey (1)
43	108.8	3519	108.8	OBE
44	61.6	3522	61.6	Phila.
45	159.1	3531	159.1	Phila.
46	444.4	3534	76.6	Phila.
		3535	301.1	Phila.
		3537	66.7	Phila.
47	59,287.0	3541	31,062.7	Phila.
		3542	986.5	Phila.
		3544	8,849.5	Phila.

Table 1 (Cont'd)

I-O Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
		3545	17,434.6	Survey (2)
		3548	953.7	Survey (1)
48	57,476.9	3551	133.8	Phila.
		3552	41,967.1	Survey (2)
		3554	10,806.0	Survey (1)
		3555	315.1	Phila.
		3559	4,254.9	Survey (2)
49	14,411.4	3561	6,938.3	Survey (1)
		3565	861.0	Phila.
		3566	573.6	Phila.
		3567	3,236.9	Phila.
		3569	2,801.6	Survey (1)
50	9,628.4	3599	9,628.4	OBE
51	194.9	3571	76.6	Phila.
		3579	118.3	Phila.
52	3,373.8	3581	629.9	Phila.
		3582	67.0	Phila.
		3585	2,422.3	Phila.
		3589	254.6	Phila.
53	9,309.6	3613	4,349.4	Phila.
		3622	3,139.0	Phila.
		3629	1,821.2	Phila.
54	4,107.9	3634	110.1	Phila.
		3639	3,997.8	Phila.
55	60,778.6	3642	3,509.1	Phila.
		3643	57,269.5	Phila.
56	2,339.7	3662	2,339.7	Phila.
57	36,610.9	3674	14,377.7	Infl. T
		3679	22,233.2	Phila.
58	6,246.4	3691	1,154.9	Phila.
		3699	5,091.5	OBE
59	11,679.6	3713	755.3	Phila.
		3717	10,924.3	Survey (1)
60	5,814.9	3721	58.4	Phila.
		3722	3,111.9	Phila.
		3729	2,644.6	Phila.
61	4,836.2	3731	387.2	Phila.
		3732	4,449.0	Phila.
62	51,333.4	3811	26,947.0	Phila.
		3821	10,805.9	Survey (1)
		3822	476.5	Phila.
		3841	907.5	Phila.
		3842	8,190.5	Phila.
		3872	4,006.0	Survey (1)
63	14,049.4	3831	154.6	Phila.

Table 1 (Cont'd)

I-O Sector	I-O Control ($ 000)	4-Digit SIC	SIC Control ($ 000)	Source of Coefficients
64	352,732.3	3851	12,499.3	Survey (2)
		3861	1,395.5	Phila.
		3911	93,934.8	Survey (3)
		3912	35,204.0	Survey (2)
		3913	5,601.0	Phila.
		3914	30,572.0	Survey (1)
		3931	338.3	Phila.
		3941	20,375.6	Survey (1)
		3949	2,433.2	Phila.
		3951	4,254.0	Survey (1)
		3953	519.0	Phila.
		3961	125,038.0	Survey (7)
		3962	4,270.2	Survey (1)
		3963	384.6	Infl. P
		3964	17,503.1	Survey (1)
		3981	178.4	Phila.
		3983	207.1	Infl. P
		3988	660.5	Phila.
		3993	3,147.9	Phila.
		3999	8,110.6	Survey (1)

III

DEVELOPMENT OF THE NON-MANUFACTURING SECTORS

A. AGRICULTURE FORESTRY AND FISHERIES

I-O 1. Livestock and Livestock Products

The output of this industry as shown in the OBE input-output table for 1958 exceeds the value of production shown by the U.S. Department of Agriculture in Agricultural Statistics which is based on the reports of the Department's Statistical Reporting Service. The major differences arise because of the inclusion of intrastate interfarm shipments of animals and because of imputed values for manure, animal work power and farm rental income in the OBE output. There is no satisfactory basis in published statistics for making these imputations for the Providence SMSA so it was assumed that these items were in the same proportion to identifiable output in the SMSA in 1963 as they were nationally in 1958. The value of production nationally in 1958 in the ten categories of output falling in this sector given in Agricultural Statistics was $20,992,773,000 or 80.21 percent of the output for 1958 shown by OBE in the input-output table. The output in these ten categories is available on a state basis for Rhode Island for 1963. This data was combined into four categories for which county data was available.

Division of this output between those parts of the State in the SMSA and those parts outside was accomplished by using county output figures for 1964 published by the Census of Agriculture. Bristol, Kent, and Providence counties were regarded as being totally in the SMSA while Newport and Washington counties were regarded as being totally outside the SMSA. (Actually four towns with large areas, most of which are forested, are in Providence or Kent counties and not in the SMSA, while three towns with smaller areas but much larger

proportions of crop and pasture land are in the SMSA but in Newport or Washington counties.) Ratios between production in the Rhode Island sector of the SMSA and State production were established for the four categories in 1964.

Output was estimated separately for these categories partly to facilitate allocation of State data to the SMSA and partly to facili tate more realistic estimating of inputs to the sector. This was necessary because the volume of output in each of these categories locally is not in proportion to output nationally. Output for the Massachusetts part of the SMSA was estimated in a similar way assuming that 20 percent of the output for Bristol and Norfolk counties was in the SMSA. (This is the proportion of the area of these counties which is in the SMSA.)

The compiled value of product shown in Table 1 - 2 for 1958 nationally is 80.21 percent of the 1958 OBE output for the sector less transfers. The major differences are intrastate interfarm animal shipments and imputed values of manure, animal work power and farm rental income. For some of these items one would expect a higher proportion in the Providence SMSA, for others a lower proportion to compiled value of product. To assume the same proportion overall seems reasonable. In the absence of any knowledge of how this under coverage was distributed to the four categories it was assumed to be proportional to compiled output. Final estimates of output by category are shown in Table 1 - 3.

In determining the inputs for this sector a study made by the U. S. Department of Agriculture, Agricultural Marketing Service entitled Dollar Volume of Agriculture's Transactions with Industry[1] provided coefficients using the sectoring of the 1947 BLS input-output study. Their sectors, meat animals and other livestock products, correspond to our category livestock and wool. Since the output of wool was less than one half of 1 percent of the output of this category no significant error was involved in using the coefficients of the meat

1. Marketing Research Report No. 375 (December 1959).

Table 1 - 1

DETERMINATION OF PART OF STATE PRODUCTION IN SMSA[a]

Product	Value of Products Sold by Commercial Farms in 1964 (thousands of dollars)					Census of Agriculture			
	R.I.	Bristol	Kent	Providence	3 Counties as %	Mass.	Bristol	Norfolk	2 Counties as %
Poultry and Poultry Prod.	3,545	83	194	2,250		25,732	3,252	2,756	
Chicken Eggs[b]	2,617	63	92	1,780	73.91	18,167	2,256	1,912	22.94
Other[b]	982	20	102	470	63.79	7,565	996	844	24.32
Dairy Products	5,507	656	293	1,879	51.35	44,642	5,902	1,942	17.57
Livestock and Wool	893	91	99	392	65.17	9,071	1,188	442	17.97

a. Source: Census of Agriculture 1964, Vol. I, Pts. 4 and 5, Counties Table 5.

b. Value determined from output in dozens by using price per dozen implicit in value and quantity figures given for all farms in state Table 8. Other poultry by difference.

Table 1 - 2

VALUE OF PRODUCT NATIONALLY (1958) AND FOR RHODE ISLAND AND MASSACHUSETTS

1963 and Assignment to SMSA (thousands of dollars)

Product	National 1958	Rhode Island 1963	% in SMSA	Value in SMSA	Mass. 1963	% in SMSA	Value in SMSA
Livestock and Wool[a]	12,374,074	1,622	65.17	1,057	10,771	3.59	387
Milk	5,037,729	6,860	51.35	3,523	51,689	3.51	1,814
Eggs	1,978,052	3,225	73.91	2,351	22,991	4.59	1,055
Poultry	1,532,918	1,178	63.79	751	9,224	4.86	448
TOTAL	20,922,773	12,885		7,683	94,675		3,704

a. Includes animals shipped in from other states to agricultural producers in this state.

Table 1 - 3

ESTIMATED OUTPUT OF LIVESTOCK AND LIVESTOCK PRODUCTS, PROVIDENCE SMSA

1963 (thousands of dollars)

	Compiled Output	Coverage Factor	Estimated Output
Livestock[a] and Wool	1,444	80.21%	1,800
Milk	5,337	80.21%	6,654
Eggs	3,406	80.21%	4,246
Poultry	1,199	80.21%	1,495
TOTAL	11,386	80.21%	14,195

a. Includes animals shipped in from other states to producers in this state.

animals sector for this category. Their sector "poultry and eggs" covers our two categories poultry and eggs and their sector "farm dairy products" seems essentially the same as our category milk. The coefficients were directly applied in both cases.

These coefficients showed inputs on a coarser matrix than the one used in our study except for the agricultural sectors. Fortunately, many of our sectors grouped together in their matrix showed no input or negligible inputs to agriculture. When a breakdown of inputs between sectors of origin was required the proportions established for inputs into sector 1 in the matrix published by the OBE for 1958 were used to make the allocation.

The inputs determined in this way showed no breakdown according to origin within or outside the SMSA. To accomplish this allocation for this sector as well as for other sectors or parts of sectors for which we had no survey data on geographical origin of inputs, the inputs shown on our survey questionnaires broken down by georgraphical origin were compiled for inputs from each sector. A table showing the percentage of the surveyed inputs from each sector which was obtained from producers within the SMSA is shown in the section discussing the development of the manufacturing part of the

matrix. These percentages were used in order to allocate the inputs to I-O sector 1 except in the case of the large input from I-O sector 2 which was independently estimated, with the input from producers within the SMSA being the total amount of field crops produced and farm consumed as estimated for I-O sector 2.

I-O 2. Other Agricultural Products

Products of this sector are primarily field crops and are relatively unimportant in the Providence SMSA. Agricultural Statistics enumerates over 70 crops but only seven of these are produced in sufficient quantity in Rhode Island to be included in the figures in this annual publication compiled from reports by the Statistical Reporting Service of the Department of Agriculture. For Massachusetts twelve crops are reported but the additional crops are not significant in the Massachusetts part of the Providence SMSA. On the other hand, some crops for which Agricultural Statistics shows no production in Rhode Island are reported in the Census of Agriculture in amounts which, while very small by national standards, are not negligible by local standards. Furthermore, Agricultural Statistics does not report production of greenhouse and nursery products which is the major item of sales by this sector locally. For these reasons it was decided that 1964 Census of Agriculture figures would provide a better indication of 1963 output of this sector in the Providence SMSA than could be obtained from Agricultural Statistics.

The 1964 Census of Agriculture compiles in County Table 6 value of products sold by counties for four categories of product falling in this I-O sector: field crops other than vegetables, fruits and nuts; vegetables; fruit and nuts; and forest products and horticultural specialties. For the state of Rhode Island forest products, which is part of the output of sector 3 is 0.54% of this fourth category; it is assumed this proportion holds for all counties in the SMSA. For the reasons outlined in the discussion of I-O sector 1, output of the SMSA was taken as output of Bristol, Kent and Providence counties in Rhode Island and one-fifth of the output of Bristol and Norfolk counties in Massachusetts.

Table 2 - 1

1964 SALES OF OTHER AGRICULTURAL PRODUCTS BY COUNTIES, PROVIDENCE SMSA[a]

(thousands of dollars)

	Bristol (R.I.)	Kent	Providence	Bristol (Mass.)	Norfolk	20% of 2 Counties	Total SMSA
Vegetables	43	59	240	1,254	104	272	614
Fruits and Nuts	1	39	389	405	76	96	525
Field Crops (sold)	7	31	86	324	66	78	190
Horticultural Specialty Products[b]	146	473	947	1,259	1,840	620	2,186
							3,515

a. Source: 1964 Census of Agriculture, Vol. I, Pts. 4 and 5, County Table 6.

b. 99.46% of forest products and horticultural specialty products.

This compiled total for the SMSA is substantially less inclusive of output than the OBE figures compiled nationally for this I-O sector in 1958. Adjustment was made as follows:

The 1959 Census of Agriculture reported only $13,433 million for crops sold and $19,109 million for crops harvested in 1959 compared to the 1958 OBE input-output figure of $23,395 million for the sector. The 18.32% difference between the Census of Agriculture value for crops harvested and the OBE figure is accounted for largely by imputations of value for pasturage, fuel wood and farm rental income and from receipts for custom work and partly by different coverage, bases of estimation, etc., as well as the one year difference in date. The use of 1959 data instead of 1958 probably accounts for little of the difference since the U. S. Department of Agriculture's Economic Research Service estimates output as only 1 percent different for the two years. There is no reason to think that the factors involved in the difference are ones which would not apply to the Providence SMSA in roughly equal proportions. Therefore, compiled estimates for the SMSA were inflated

from the 81.68 percent level to 100 percent.

The $5,676 million difference between crops sold and crops harvested nationally as reported by the Census of Agriculture poses a more serious problem. Almost 80 percent of the difference in 1958 is accounted for by corn and hay harvested and used on the same farm. Addition of the small grains (wheat, barley, and especially oats) and sorghum accounts for another 15 percent of the difference. For other field crops the on-farm consumption is small and the crop is either not grown in the SMSA or is of negligible value here. Separate estimates of value of crops produced and consumed on the same farm were made for corn, hay or all kinds, wheat, oats, and rye for the SMSA. No production of sorghum was reported for Rhode Island or Massachusetts by the Census and the entire Rhode Island output of "other grains" (which includes barley) was reported as sold.

Physical output figures by counties are available for these products and value figures were developed from these as shown in Table 2 - 2. All output accounted for as produced and consumed on the farm is in the category of field crops. Coverage for field crops when thus augmented was deemed essentially complete and no inflation seemed necessary. Values per acre, per ton or per bushel were established from Census figures in Table 9 for Rhode Island for field crops as follows:

Corn harvested for grain	$1.65 per bushel
Corn cut for silage	$120 per ton
Corn cut for fodder or hogged or grazed	$143 per acre
Wheat	$1.80 per bushel
Oats	$0.90 per bushel
Rye	$1.20 per bushel
Alfalfa	$51 per ton
Clover and timothy hay	$41 per ton
Small grain hay	$38 per ton
Other hay	$36 per ton
Grass Silage	$11 per ton

Table 2 - 2

PRINCIPAL CROPS HARVESTED AND NOT SOLD, PROVIDENCE SMSA - 1964[a]

	Bristol (R.I.) County	Kent County	Providence County	Bristol (Mass.) County	Norfolk County	20% of 2 Mass. Counties	Total for SMSA	Value
Corn harvested:								
for grain (bu)	2,000	---	9,130	4,309	---	862	11,992	19,787
for silage (tn)	4,498	3,006	12,005	38,267	3,050	8,263	27,772	3,332,640
for fodder (acres)	---	2	60	129	5	27	89	12,727
(or hogged or grazed acres)	---				---			
Wheat (bu)	---	---	10	620	---	124	134	241
Oats (bu)	---	---	---	200	---	40	40	36
Rye	---	---	---	112	---	22	22	26
Alfalfa (tons)	217	182	1,514	2,525	3,063	1,118	3,031	154,581
Clover - timothy hay (tons)	531	835	4,249	6,944	3,059	2,001	7,616	312,256
Small grain hay (tn)	28	14	37	463	34	99	176	6,688
Other hay (tons)	166	272	607	1,352	284	327	1,372	49,392
Grass silage (tn)	1,535	758	2,450	14,351	1,343	3,139	7,882	86,702
								3,975,076

a. Sources: Census of Agriculture 1964, Rhode Island and Massachusetts County Table 13.

For determination of inputs through the use of the coefficients developed by the U. S. Department of Agriculture[2] in its Dollar Volume of Agriculture's Transactions with Industry, output must be classified according to the 12 categories of that study which fall in this I-O sector. Six of these categories (cotton, tobacco, oil-bearing crops, tree nuts, sugar and syrup crops and miscellaneous crops) cannot be identified as produced in the Providence SMSA. No significant error in input estimates will arise from grouping two other categories, legume and grass seeds (estimated output less than $500) and food grains (estimated output $25,000) with feed crops in the category field crops. The 12 categories thus reduce to the four categories of product for which data are available in the Census and for which Providence SMSA data are presented in Tables 2 - 1 and 2 - 2.

For crops other than field crops reported sales in the Census of Agriculture were 97.02 percent of value of reported production nationally for 1959. It seems likely a similar difference exists in the Providence SMSA for 1964, accordingly in Table 2 - 3 compiled sales were inflated from an assumed 97.02 percent level to 100 percent to account for underreporting of sales and for on-farm use.

Table 2 - 3

ESTIMATED OUTPUT OF OTHER AGRICULTURAL PRODUCTS, SMSA 1963 PROVIDENCE

	Compiled Output	Estimated % Coverage	Census/OBE Factor	Estimated Output
Vegetables	614	97.02	81.68	775
Fruits and Nuts	525	97.02	81.68	662
Field crops (sold)	190	100	81.68	233
Field crops (farm consumed)	3,975	100	81.68	4,867
Horticultural specialty products	2,186	97.02	81.68	2,759
SECTOR TOTAL	7,490			9,296

2. Marketing Research Report #375, Agricultural Marketing Service, (December 1959).

The inputs to I-O Sector 2 and the geographical division of their origin was made in the same way as for I-O Sector 1.

I-O 3. Forestry and Fishery Products

This I-O sector includes SIC074 Hunting, Trapping and Game Propogation; SIC08 Forestry, except 085 forestry services; and SIC09 Fisheries, except 098 Fishery services.

(1) SIC074 Hunting, Trapping and Game Propogation is unimportant in the Providence SMSA. The wild fur-animal catch in Rhode Island in 1963, according to figures compiled by the U.S. Department of Interior, Fish and Wildlife Service, was largely muskrat. This was probably taken mostly in Washington County in areas outside the SMSA. Total reported catch in the State valued at Pennsylvania values--the only values reported for the Northeast--amounted to $9,600. There are some trapping areas in the Massachusetts part of the SMSA but these are relatively minor compared to the area outside the SMSA in Rhode Island. Production in the SMSA was estimated at $4,000. No commercial fur animal farms operated in the SMSA according to the Rhode Island Department of Natural Resources.

(2) SIC08 Forestry, except 085 forestry services.

The growing of trees for reforestation but not for landscaping is included in this industry but is not carried on in the State, such seedlings being purchased by the State from Connecticut.

Forest products produced as secondary output of farms as reported by the last four censuses of agriculture (1950, 1954, 1959, and 1964) are between $18,000 and $23,000 for the State. Such production in the SMSA, including the Massachusetts sector is estimated at one-half that for the State. Production for 1963 in the SMSA is estimated at $10,000.

The most significant output for the industry is the value of standing timber cut during the year, i.e., the value of stumpage rights. These were estimated from the value of shipments by logging camps and logging contractors and sawmills and planing mills in the SMSA. The adjusted estimate of shipments of sawmills and planing mills (general) in the SMSA developed in connection with our analysis of manufacturing

in the SMSA is $231,000. The cost of stumpage for all such mills in the United States was 10.65 percent of the value of shipments according to data published in the 1963 Census of Manufacturers; the cost of stumpage is thus estimated at $24,600 for the SMSA for these mills. Similar estimates for the other categories of sawmills and planing mills and for logging camps and logging contractors total $9,400, giving an estimate of $34,000 for stumpage value for the SMSA. This estimate is in line with a 1952 estimate of stumpage value at $50,000 to $75,000 for the entire state from a U. S. Forest Service Study "Timber Resources of Rhode Island."

The estimate of stumpage of $34,000 for the SMSA for 1963 was not adjusted for over- or undercoverage and no adjustment for national forest production was needed since there are no national forests in the area.

(3) SIC09 Fisheries, except 098 fishery services.

The U. S. Department of Interior, Fish and Wildlife Service publishes a summary of Rhode Island landings of finfish and shellfish. The statistics for 1963 for the State are shown in Table 3 - 1. This table also shows their division between sites within the SMSA and those outside based on estimates by Mr. William Murphy of the local office of the Fish and Wildlife Service, Bureau of Commercial Fisheries.

Inputs were determined by using inputs exclusive of transfers shown for the sector on the OBE table and inputs for fisheries shown on the microfilm of the OBE work papers. The difference between the sector inputs and those shown for fisheries was weighted for an output of $48,000 and the fisheries inputs for an output of $3,552,000. Immaterial inputs were obtained directly from the OBE table adjusted for level of sector activity in Providence SMSA.

Table 3 - 1

RHODE ISLAND AND PROVIDENCE SMSA LANDINGS OF FISH - 1963

Type of Fish	Landings in State 1963 (thousands of dollars)	% at Sites in SMSA[a]	Value Landed in SMSA (thousands of dollars)
Finfish	2,388	90	2,149
Clams, bay	1,295	99	1,282
Lobsters	327	25	82
Squid	44	50	22
Other shellfish	17	90	15
Bay scollops	3	75	2
TOTAL	4,074		3,552

a. Includes Point Judith - Galilee, Wickford, Warren, Warwick, East Greenwich.

Total output of I-O Sector 3 is thus estimated at $3,600 thousand.

I-O 4. Agricultural, Forestry and Fisheries Services

SIC 071 - Agricultural services except animal husbandry and horticultural

SIC 0723 - Poultry hatcheries

SIC 0729 (part) - Animal breeding, but not feed lot operations and boarding animals

SIC 085 - Forestry services on fee basis--cruising timber marketing service, fire fighting, etc.

SIC 098 - Fishery services--fish hatcheries and fishing preserves

According to the study prepared by Jack Faucett Associates, entitled 1958 Output Measures for Input-Output Sectors by Standard Metropolitan Statistical Areas and Non-Metropolitan State Areas (Appendix B page 4-3) information available on a regional basis shows that receipts from cotton ginning, from custom work, etc., and from poultry hatcheries production accounted for 92.72 percent of the OBE sector output.

Although there is no cotton ginning in the Providence SMSA and relatively minor receipts from custom work, poultry hatching is

a relatively important activity and there seemed no reason to assume that the ratio of coverage in the area was different from that found in the Faucett study. The output of custom work and of chick hatcheries, $553,000 was inflated to $597,000 as the output at 100 percent coverage.

Inputs were determined by using the coefficients developed for the poultry and poultry products part of I-O Sector 1 with some modification to fit the known character of chick hatching in this area.

B. MINING

I-O 5. Iron and ferroalloy mining SIC 10
I-O 6. Non-ferrous metal ores mining
I-O 7. Coal mining; SIC 11 and SIC 12
I-O 8. Crude petroleum and natural gas; SIC 13
I-O 10. Chemical and fertilizer mineral mining; SIC 147

The Census of Mineral Industries for 1963 shows only one establishment in Rhode Island or Massachusetts in SIC major groups 10, 11, 12, and 13 and industry group 147. This is a central office for a lead and zinc ore producer (SIC 1031) located in Massachusetts. This office is probably in Boston and is almost certainly not in Attleboro or any other part of the Providence SMSA. We conclude that these five I-O sectors (5-8 and 10) have no output in the SMSA.

I-O 9. Stone and Clay Mining and Quarrying; SIC 14, except 147

(1) This is the only mineral industry represented in the SMSA. It comprises all of SIC major group 14 except industry group 147. There are 23 establishments in this group including two very small establishments (1 - 4 employees each) which are also included in manufactures. One of these is a dimension stone plant in Washington County outside the SMSA. The other is a sand and gravel plant in Providence County. The value of the output of these small operations should be included in the appropriate manufacturing category and hence is not included here. Value of shipments and receipts for Kent County and Providence County as given by the Census of Mineral Industries total $2,493,000. No establishments are shown for Bristol County (R.I.).

The Minerals Yearbook for 1963 enumerates the major operations. In Kent and Providence Counties all of them are located within the SMSA. No operations are enumerated for parts of Newport or Washington Counties included in the SMSA. The total shipments and receipts reported for Kent and Providence Counties in the Census is therefore taken as the output for the Rhode Island part of the SMSA.

(2) For the Massachusetts part of the SMSA, value of shipments and receipts for mineral industries for the counties of Norfolk and Bristol (Mass.) were allocated in proportion to the area within the SMSA. (Area rather than population was used since sand and gravel deposits and stone outcrops in both counties are rather ubiquitous and tend to be worked to at least as great an extent in the relatively sparsely populated sections of the counties as in the more built up areas.) The very small part of Worcester County (1.15 percent of the population and 1.05 percent of the area of the county) in the SMSA had no important producer of sand, gravel, or crushed stone according to the Minerals Yearbook so no production was assigned to these two small towns. Bristol County (Mass.) had $1,700,000 value of shipments and receipts of mineral industries, 20.29 percent or $344,930 of which was allocated to the SMSA. Norfolk County had $3,305,000 of which 19.63 percent or $648,772 was allocated to the SMSA. The total for the Massachusetts part of the SMSA, $993,702 seems reasonable in relation to the $2,493,000 for the Rhode Island part of the SMSA on the basis of casual observation. Most of the sand, gravel and crushed rock for the highly urbanized part of the SMSA which stretches along the state line from Woonsocket to Warren comes from the Massachusetts side of the line.

(3) Total output for I-O sector 9 as shown in the 1958 OBE table was substantially equivalent to shipments as reported in the Census so no correction factor was applied. Output was estimated at $3,487,000.

Since crushed and broken stone and sand and gravel constitute about 80 percent of the output of the sector nationally and since both are produced in the SMSA, the input coefficients for the sector

nationally, after removal of transfers, were, in the absence of survey data, used to estimate inputs to the sector locally.

C. CONSTRUCTION

I-O 11. New Construction

SIC 15, 16, 17 (part) Contract Construction.

SIC 6561 (part) Operative Builders.

Industry data is not often given in terms of the SIC categories and this discussion of our procedure will also ignore SIC categories.

I-O 11 is essentially equivalent to the sum of the Department of Commerce, Business and Defense Services Administration's figure for value of Construction Put in Place (see Construction Statistics published as January 1966 Supplement to the Construction Review) plus the Census of Mineral Industries figure for Costs of Drilling and Equipping Oil and Gas Wells. Since no oil or gas well drilling was done in the Providence SMSA the output estimate for I-O 11 was simply an estimate of the portion of the Value of Construction Put in Place that applied to the SMSA.

In Table 11-1 the estimating process is outlined. The basic assumption here is that the ratio of contract awards to construction put in place by types of construction are the same in the United States and in the Providence SMSA.

The estimate of construction put in place in the Providence SMSA is derived from that for the State of Rhode Island by using the ratios of population. This method is predicated upon the ideas that construction output occurs on the site and that in any area it is roughly in proportion to population. Enterprises carrying on construction which are headquartered in the SMSA almost certainly employ more workers than do such enterprises in the State (see BLS estimates of contract construction employment reported in Construction Statistics, page 72) but this is not the relevant consideration if the output is deemed to occur at the site.

The estimates for building construction derived in this way seem

Table 11-1

ESTIMATE OF CONSTRUCTION PUT IN PLACE PROVIDENCE SMSA 1963

Type of Const.	Const. Put in Place US Total 1963 ($000,000)	Contract Awards US Total 1963 ($000,000)	Ratio	Contract Awards R. I. 1963 ($000)	Estim. Const. Put in Place R. I. 1963 ($000)	SMSA Pop ÷ R.I. Pop. 1960 Census	Estim. Const. Put in Place Prov. SMSA 1963 ($000)
Residential	27,093	20,502	1.3215	66,453	87,818	.9553	83,893
Non-Residential Building	18,182	14,377	1.2647	60,982	77,124	.9553	73,677
Non-Building	17,480	10,667	1.6387	58,892	96,506	.9553	92,192[a]

a. Reduced to $75,042,000; see text.

in reasonable agreement with other estimates[3] but the estimate for non-building seems excessive. This is probably because of much more complete coverage of contract awards in this area than occurs nationally. The Philadelphia study estimates 99 percent coverage in their area. It seemed realistic for the Providence SMSA to estimate that the undercoverage for non-building construction was substantially less than in the United States as a whole. The estimate used was therefore the average of the $58,892,000 contract awards for the State and the $92,192,000 figure developed in Table 11-1 or $75,042,000 giving a total output for I-O 11 of $233,612,000.

Development of Input Coefficients.

In order to develop appropriate input coefficients output was divided into eight different categories. The principal basis for this division was the breakdown of payrolls by types of contracting firms reporting FICA deductions as shown in County Business Patterns, 1964. These payroll figures for the first quarter of 1964 for the state are adjusted to give SMSA payroll figures for 1963 in Table 11-2. The first step is to adjust the first quarter 1964 payrolls reported in County Business Patterns ($15,424,000) to the level of those reported by the Rhode Island Department of Employment Security ($16,075,687) which reports in its mimeographed quarterly releases the total payrolls of covered enterprises instead of covered payroll. The second step is to adjust the first quarter 1964 to the year 1963 by "eliminating"

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3. For example, private residential and non-residential building construction put in place in the United States in 1963 according to Department of Commerce estimates (Construction Statistics, page 2) was $25,843,000,000 and $11,863,000,000 respectively. Value of buildings permits as compiled in the same source for 3,014 permit issuing places (p. 37) was $21,832,300,000 for both types combined. Rhode Island permits covered $78,500,000 which when inflated to account for the same rate of undercoverage revealed in the national figures gives an estimate of $135,575,000 for private building construction in Rhode Island. This compares well with the total of $164,942,000 for all building public and private derived using contract award figures.

Similarly, the estimate developed for output of general contractors in Table 11-3 below using payroll and wage coefficients is in close agreement.

Table 11-2

PAYROLL BY TYPE OF CONTRACTOR, ESTIMATE FOR PROVIDENCE SMSA 1963

Type of Contractor	1st Q 1964 Payroll: County Bus. Patterns adj. to DES level	1st Q 1964 Payroll: DES Payroll	1963 Payroll DES	Seasonal Index (Yr. '63 ÷ 1st Q 1964)	Estimated 1963 Payroll: R.I.	Estimated 1963 Payroll: For Construction in SMSA
All contractors	$16,075,687	$16,075,687				
General Contractors Building	5,541,651	6,511,401	$26,613,607	4.087	$22,649,000	$21,637,000
Highway and street Construction	1,928,165	2,571,325	14,672,036	5.706	11,002,000	10,510,000
Heavy Construction N.E.C.	1,278,843			5.706	7,297,000	6,971,000
Special Trades Contractors, Total	7,327,028	6,992,961	32,117,597	4.593	33,653,000	32,149,000
Plumbing, Heating Air Cond.	1,995,911			4.593	9,167,000	8,757,000
Electrical	1,403,913			4.593	6,448,000	6,160,000
All other	3,927,204			4.593	18,038,000	17,232,000

seasonality and trend, using the ratios found in the DES figures. The ratios from the DES categories are applied to each subdivision of the category for which wage figures were obtained from the County Business Patterns. Finally the figures are reduced to an SMSA estimate by using the same population ratio used in estimating output. At a later stage in the analysis the category general contractors, building is divided into residential and non-residential so that output of each is proportional to the estimates developed from contract awards while plumbing, heating and air conditioning is divided assigning 20 percent of output to air conditioning. (See Table 11-3)

The question might well be raised about the use of the County Business Patterns figures when they are so liberally adjusted to the level and seasonal pattern of the DES figures which record actual reported payrolls in 1963. The two reasons are that County Business Patterns gives a breakdown into a much larger number of categories and that the breakdown between major categories is substantially different. The County Business Patterns breakdown seems more in conformity with that in the output statistics published by the U.S. Department of Commerce.

Eight branches of contract construction were distinguished and wage and sub-contracting coefficients were derived from survey returns and from Philadelphia Region coefficients as shown in Table 11-3 together with the payroll estimates developed in Table 11-2. This leads to an independent estimate of both sub-contracting and general contracting work done. The coefficients were obtained as follows: For residential general contractors amounts of sub-contracts reported on survey questionnaires were summed and divided by total output. For non-residential building general contractors the sub-contracting coefficient was determined by a simple average of the percentages of sub-contracting shown on the survey returns. Wages reported on many questionnaires for both these groups of contractors were inconsistent with other data on the questionnaire so the Philadelphia coefficients adjusted for the differences in rates of sub-contracting were used. These amounts seemed consistent with other information on the Providence SMSA questionnaires.

Table 11-3

CONSTRUCTION IN THE PROVIDENCE SMSA, 1963 BY TYPES

	Estim. of Payroll ($000)	Wage Coef.	Estim. of Output ($000)	Sub-Contract Coef.	Estim. of Sub. Contr. ($000)
Residential Bldg.	9,227	.1112	82,981	.2763	22,928
Non-Residential Bldg.	12,411	.1703	72,876	.5750	41,904
Highway and Street	10,510	.2211	47,535	.1572	7,473
Heavy Construction n.e.c.	6,971	.2306	30,230	.1796	5,429
TOTAL			233,622		
Ventil. and Air Conditioning	1,363	.2372	5,745	.1788	1,027
Plumbing and Heating	7,395	.3218	22,980	.1003	2,305
Electrical	6,160	.4424	13,924	.0394	549
Spec. Trades n.e.c.	17,232	.3290	52,377	.0821	4,300
TOTAL			95,026		

For highway and street construction there were no survey returns and Philadelphia coefficients were used. For heavy construction, n.e.c. Philadelphia coefficients were used to represent a statistical enterprise comprising between 50-75 percent of the industry, both to avoid any possibility of disclosure and to give a broader base.

In sub-contracting the most important category is plumbing, heating, ventilating and air conditioning. Survey returns showed that two parts of this category had substantially different coefficients. Ventilating and air conditioning returns were totalled to obtain coefficients for that part of the category, and predominantly plumbing and heating returns were totalled to obtain coefficients for that part. For electrical contracting the sub-contracting coefficient was obtained from the survey, but omission of information on wages forced the use of the Philadelphia Region coefficient adjusted for the slight difference in rate of sub-contracting for the wage coefficient. For special trades contractors, n.e.c. the wage and sub-contracting coefficients were obtained by summing the survey questionnaires for which wages were known but giving only half weight to concrete specialists who would otherwise have been seriously over-represented. The implicit weights thus used were in rough agreement with the importance of the special trades revealed by the County Business Patterns data.

The estimates of output by general contractors obtained incidentally in this way closely approximate the outputs shown in Table 11-1 as subsequently corrected. The ratio of output of highway and street contractors to the heavy construction n.e.c. contractors developed here was used to divide the estimate previously obtained for the combined category.

The estimates of output by the special trade contractors n.e.c. of $95,026,000 and the estimate of sub-contracts let of $85,915,000 leaves a difference of $9,111,000 which is substantially less than the amount of special trades work done on maintenance and repair construction. This shortfall in output calculated from payroll and wage coefficient data arises largely, if not entirely from the large

amount of self-employment in special trades sub-contracting, especially in the parts done for residential construction, for maintenance and repair, and for other special trades contractors. Some indication of the persons working in the construction industry but not covered by Department of Employment Security compilations is obtained when the 1960 population census figure for persons employed in construction in the State (16,780) is compared with average 1960 employment in construction reported by the DES: 11,900. For manufacturing the DES reported 119,300 persons employed, while the Census of Population reported 124,639. (Average employment in construction in 1963 according to the DES was 12,700 while the peak employment reported for any month was 14,584.) No attempt was made to estimate the extent of undercoverage.

Since the 1958 OBE Input-Output Table treats construction on a net basis--essentially eliminating the double counting of intra-industry transactions--derived inputs from sub-contracting for the categories of final product as well as the inputs from the general contractors had to be determined. To do this dollar amounts and coefficients for each type of sub-contracting were needed. Since no information on types of sub-contractors doing the sub-contracting reported by the contractors was obtained in the Providence survey the Philadelphia Region coefficients adjusted for overall level of sub-contracting were used to determine the amount of each type of sub-contracting used by different types of general contractors. The coefficients and the estimated dollar amounts of four categories of sub-contracts let by the general contractors and by their sub-contractors are shown in Table 11-4.

To determine the inputs from other I-O industries, input coefficients were developed for each of eight types of contracting using survey data in all cases except street and highway construction for which Philadelphia Region coefficients were used and adding statistical enterprises based on Philadelphia Region coefficients in heavy construction, n.e.c. (comprising 60-80 percent of the total), and in electrical contracting (comprising 50-70

Table 11-4

SUB-CONTRACTING COEFFICIENTS AND AMOUNTS
PROVIDENCE SMSA 1963

Type of Contractor	Estimated Output ($000)	Sub-contracting coefficients: Plumbing and Heating	Air Cond.	Elec-trical	Special Trades n.e.c.	Sub-contracting amounts: Plumbing and Heating ($000)	Air Cond.	Elec-trical	Special Trades n.e.c. ($000)
Residential Building	83,893	.0422	.0074	.0130	.2137	3,537	624	1,091	17,928
Non-Residential Building	73,677	.1393	.0383	.1281	.2690	10,260	2,825	9,438	19,819
Street and Highway Construction	45,871	----	----	.0111	.1461	----	----	509	6,702
Heavy Construction	29,171	----	----	.00855	.1710	----	----	249	4,988
Total Direct Sub-contracting						13,797	3,449	11287	49,437
Direct Sub-contracting									
Plumbing and Heating Contr.	13,797	----	----	.0281	.0722	----	----	388	996
Air Conditioning Contractors	3,449	----	----	.0502	.1286	----	----	174	444
Electrical Contractors	11,287	----	----	----	.0339	----	----	----	383
Special trades, n.e.c.	49,437	----	----	----	.0821	----	----	----	4,059
Grand Total Direct and Indirect						13,797	3,449	11849	55,319

percent of the total). In both cases the addition of the statistical enterprises was designed largely to offset an atypical distribution of output (and hence inputs) within the given contracting category on the Providence survey returns. The coefficients for special trades contractors, n.e.c. included the landscaping contractors at half weight to avoid over-representation. No adjustment for concrete contractors was needed in this case because very heavy sub-contracting by the concrete contractors automatically reduced the inputs.

Table 11-5 shows the coefficients for each branch of sub-contracting and the resulting dollar value of inputs from each I-O industry outside the SMSA to I-O 11.

Input coefficients were developed entirely from survey information for the following categories of contractors: general residential, general non-residential building, plumbing and heating, air conditioning and ventilating, and special trades, n.e.c. including landscaping. For highway and street construction Philadelphia Region coefficients were used and for heavy construction, n.e.c. and electrical contracting, statistical enterprises based on Philadelphia coefficients were introduced.

The division of inputs between producers within the SMSA and producers outside the SMSA was based on survey information. Table 11-6 shows inputs from within the SMSA. Separate coefficients for inputs from within and without the SMSA from each I-O industry were developed for general residential, general non-residential building, plumbing and heating, air conditioning and ventilating, and special trades n.e.c. contractors using the information in each group of questionnaires. These coefficients were then applied to the output totals to give dollar amounts of each input For highway and street construction, heavy construction, n.e.c., and in part for electrical contracting, the ratios of input from within and without the SMSA were obtained by taking the ratio for inputs from that industry shown for the other branches of contract construction.

I-O 12. Maintenance and Repair Construction

SIC 15, 16, 17 (parts) Contract Construction.

Table 11-5

INPUTS TO I-O 11 FROM OUTSIDE THE PROVIDENCE SMSA

Direct Coefficients of Branches of New Construction, Output of Branch, and Resulting Inputs of Intermediate Product

I-O Industry of Input	Residential Building	Non-Resid. Building	Highway & Street	Heavy Constr. n.e.c.	Plumb. Heat.	Air Cond. Contr.	Elec-trical Contr.	Special Trades n.e.c.	Total Input ($000)
Estim. Output ($000)	83,893	73,677	45,871	29,171	13,797	3,449	11,849	55,319	
2		.0025						.0180	1180
9		.0043	.0315	.0005			.0003	.0219	2988
20	.2462	.0106	.0040	.0028	.0001		.0010	.0210	25,863
23							.0010	.0002	23
24		.0007	.0002				.0003	.0007	104
27		.0002	.0001	.0011			*	.0061	389
28								.0028	155
30	.0051	.0009					*	.0308	2198
31	.0169	.0160	.0542	.0096	.0022	.0007	.0030	.0189	6477
32	.0035	.0007		.0008	.0003		.0001	.0019	479
35	.0030	.0066						.0006	771
36	.0285	0331	.0617	.0534			.0011	.0380	4401
37	.0059	.0258	.0075	.0490	.0023	.0548	.0009	.0039	1784
38	.0021						.0132	.0103	902
39	.0062								520
40	.0018	.0281	.0021	.0062	.3880	.0237		.0009	7983
41				.0001			.0004		8
42		.0007		.0024			.0012	.0253	1536
45			.0268	.0054			.0002	.0003	1406
46		.0010						.0226	1324

Table 11-5 (continued)

I-O Industry of Input	Residential Building	Non-Resid. Building	Highway & Street	Heavy Constr. n.e.c.	Plumb. Heat.	Air Cond. Contr.	Elec-trical Contr.	Special Trades n.e.c.	Total Input ($000)
47			.0012						55
49		.0066			.0080		.0003	.0020	711
52		.0330			.0094	.2335		.0009	3416
53					.0098	.0219	.2065	.0078	3089
54	.0009								76
55	.0012	.0264			*		.2125	.0029	4724
56							.0037		44
58							.0088		104
62							.0011	.0005	41
66		.0003							22
68		.0004					.0002		31
70								.0023	127
71								.0006	
72							.0001	*	1
73								.0001	6
74							.0001		1
75							.0001		1
81								.0002	11
82	.0001				.0006			.0017	110
Mater. in TOTAL	.3508								
GRAND TOTAL	.3509								

Table 11-6

INPUTS TO I-O 11 FROM INSIDE THE PROVIDENCE SMSA

Direct Coefficients of Branches of New Construction, Output of Branch and Resulting Inputs of Intermediate Product

I-O Industry of Input	Residential Building	Non-Resid. Building	Highway & Street	Heavy Constr. n.e.c.	Plumb. Heat.	Air Cond. Contr.	Elec-trical Contr.	Special Trades n.e.c.	Total Input ($000)
2		.0003						.0033	205
9	.0030	.0090	.0323	.0006	.0001		.0016	.0118	3069
12					.0002	.0003		.0006	37
20							*		*
23							.0003		4
24									
27							.0001		1
30							*		*
31	.0012	.0011	.1000			.0010	*	.0023	127
32		*				.0001	.0003	.0019	4881
							*	.0002	11
36			.0096	.0084					
37				.0010				.0196	1769
38		.0165					.0001	.0018	130
40		.0050	.0001	.0003		.0073	.0256	.0046	1773
41				.0001				.0005	435
							.0003		7
42				.0001					
49								.0002	14
53						.0011	.0001		5
54							.0050		59
55		.0066					.0066		78
								.0009	536
65			.0002		.0014	.0018	.0005	.0004	62
66	.0018	.0004	.0022	.0005	.0020	.0047	.0026	.0051	653
68	.0011	.0004	.0011	.0005	.0019	.0027	.0026	.0019	357
70	.0038	.0017	.0077	.0144	.0078	.0146	.0087	.0213	2569
71	.0018	.0007	.0032		.0064	.0091	.0016	.0074	897
72	.0003	.0005	.0005		.0006	.0007	.0004	.0006	133
73	.0089	.0002	.0052	.0036	.0040	.0113	.0073	.0061	1623
74			*				.0002	.0001	8
75	.0009	.0001	.0012	.0099	.0027	.0030	.0006	.0028	636
81	.0006		.0008		.0020			.0020	220
82	.0006	.0002	.0004			.0003	.0010	.0003	476

I-O 12 and I-O 11 are both defined as parts of SIC 15, 16, and 17. Industry data is seldom presented in terms of the SIC's and in this study as in that of I-O 11 no use is made of the SIC categories.

The amount of maintenance and repair construction was estimated separately for highways and for other types. The estimate for all maintenance and repair except to highways was based on the expenditures for the United States ($17,602,000,000) given in a special article in the July 1965 Construction Review (page 7).

Highway maintenance for the state was reported by the Department of Public Works as $5,300,000. This somewhat exceeds the amount that would be estimated by allocating highway maintenance and repairs of $2,938,000,000 for the United States to Rhode Island on the basis of its mileage of state primary roads to such roads in the United States as reported in Highway Statistics 1963 published by the Bureau of Roads of the U.S. Department of Commerce (page 104). On this basis the resulting estimate for the state would be $4,839,000. The Department of Public Works' figure for the State is reduced to an SMSA figure by using the population ratio (95.53 percent). The resulting estimate is $5,063,000.

A preliminary estimate of non-highway maintenance and repair expenditure was obtained by allocating total non-highway and repair expenditure for the United States to Rhode Island in proportion to the estimated market value of assessed taxable real property locally to that nationally (3.2 : 969.0) as reported in the Census of Government 1964, Vol. 2. This was converted to an SMSA figure by using the ratio of assessed valuation in Rhode Island to that in the Rhode Island parts of SMSA's and then was inflated by the population ratio to include the Massachusetts part of the Providence SMSA. The resulting preliminary estimate of non-highway maintenance and repair expenditure for the Providence SMSA is $58,087,000.

This preliminary estimate was then adjusted to account for the higher expenditure per housing unit in SMSA's in the Northeast as compared to the country as a whole revealed in Construction Reports C 50-9, Part 2 (March 1965) published by the Bureau of the Census

(Gov. Doc. No. C3.215/8:9). Table G on page 6 shows average expenditure for upkeep and improvement for one unit owner-occupied dwellings of $264 per year in SMSAs in the Northeast compared to $224 for the United States as a whole. It was assumed this greater expenditure applies to all building maintenance and repair in the Providence SMSA giving a final estimate of $68,460,000.

The output for both highway and building maintenance and repair construction is thus estimated at $73,523,000.

Inputs were estimated using coefficients developed in I-O 11 for special trades contractors, n.e.c.; plumbing and heating contractors; air conditioning contractors; and electrical contractors. The Philadelphia Region study found that 82.5776 percent of maintenance and repair construction was done by special trades contractors, n.e.c.; that 6.9877 percent was done by electrical contractors, and that 10.4347 percent was done by heating, plumbing and air conditioning contractors. These proportions, which are generally in accord with the breakdown in Construction Reports C 50-9, Part 2 (page 16), were used in determining inputs from within the Providence SMSA and from outside the Providence SMSA, with air conditioning assumed to be 2 percent of the total. This division seemed reasonable for all inputs except that from I-O Sector 31 to street and highway construction which is largely asphalt. Here the division was made on the basis of estimates of asphalt imported and asphalt produced in the SMSA. Waterborne Commerce of the United States - 1964 reported imports of 126,361 tons. Shipments of asphalt by all refineries in the United States were reported in the 1963 Census of Manufactures as 47,051,000 bbls valued at $360,279,000 or $7.66 per bbl. The Statistical Abstract of the United States records 5.5 bbls of asphalt per ton. Hence the asphalt imported into Providence by water (certainly most of what is imported) if valued at average refinery price was $5,324,000.

Refineries specializing in asphalt and producing between 50-75

percent of value of output as asphalt according to the Census of Manufactures had $155,687 of shipments per employee. It seems probable that the refinery in the Providence SMSA falls in this group. Employment is estimated at 117. If 60 percent of value of output was asphalt and output per employee was average the asphalt output was $10,929,200 or very slightly more than twice the estimated value of the imported asphalt. Not all of the input from I-O 31 is asphalt and more of the balance is imported. Accordingly, the input coefficient for Sector 31 to street and highway contractors of .1542 was divided, .0542 to imports and .1000 to producers within the SMSA.

D. TRANSPORTATION, COMMUNICATIONS, ELECTRIC, GAS AND SANITARY SERVICES

I-O 65 Transportation

SIC 40 Railroad transportation

SIC 41 Local and suburban transit and interurban passenger transportation

SIC 42 Motor freight transportation and warehousing

SIC 44 Water transportation

SIC 45 Transportation by air

SIC 46 Pipe line transportation

SIC 47 Transportation services

An attempt was made to develop information according to a pattern similar to that used in the New Orleans study but problems were encountered which finally forced the abandonment of this approach and the resort to a much more simplistic analysis.

U.S. Business Tax Returns, 1963 gives business receipts for transportation enterprises which covers more than 95 percent of sector output. This information is classified for corporations into seven groups and for partnerships and sole proprietorships into two groups as shown in Table 65 -1. Most of the partnerships and sole proprietorships are engaged in motor freight activity. It is assumed that the other partnerships and sole proprietorships are in local, suburban and inter-city passenger transport which includes taxicab operation. The miscellaneous category of the Internal Revenue Service is assumed to correspond to the transportation services category of the SIC classification. To allocate output to the SMSA, information from County Business Patterns 1964 was used. This source gives employment and payroll information for the first quarter of 1964 for similar categories of transportation activity. Data for the three Rhode Island counties which are almost coterminous with the Rhode Island part of

Table 65 -1

BUSINESS RECEIPTS OF TRANSPORTATION ENTERPRISES[a]

SIC	Mode of Transportation	Corporate ($000)	Partnerships	Sole Proprietorships	All Types
40	Railroad	10,903,263			10,903,263
41	Local suburban and intercity psgr.	2,018,848	281,018	879,470	3,179,336[b]
42	Motor freight	10,705,861	725,088	3,831,335	15,262,284
44	Water	3,280,684			3,280,684
45	Air	4,441,199			4,441,199
46	Pipe line	968,180			968,180
47	Miscellaneous	2,208,111			2,208,111
	TOTAL	34,526,146	1,006,106	4,710,805	40,243,057

a. Source: U.S. Business Tax Returns, 1963.

b. See text for assumption involved.

of the SMSA are shown in Table 65 -2. Estimates for the SMSA are in proportion to population of the SMSA and the three counties for local passenger transport and for trucking and warehousing. The other types of transport are deemed to be the same for SMSA and the three counties.

Table 65 -2

TAXABLE PAYROLL 1ST Q 1964, TRANSPORTATION, PROVIDENCE, KENT, AND BRISTOL COUNTIES; AND ESTIMATES FOR THE PROVIDENCE SMSA

	Three Counties ($000)	Estimate SMSA ($000)
Local passenger transportation	1,555	1,777
Trucking, warehousing	5,288	6,043
Water transportation	429	429
Air transportation	164[a]	164[a]
Pipe line	3[a]	3[a]
Transportation services	211	211

a. Payroll figure not published because of disclosure. Figure is estimate of number of employees.

The estimate of output nationally for the sector first had to be augmented by rent and royalty receipts (available only for corporations) and excise taxes on transportation of persons, which in 1963 applied only to air transportation. These items amounted to $535,464,000 and $170,000,000 respectively. The former was assigned to railroads and the latter to air transport. With these amounts added a total output of $40,948,521,000 as reported and classified by the Internal Revenue Service was obtained. Jack Faucett Associates in their 1963 Output Measures for Input-Output Sectors by Standard Metropolitan Statistical Areas and Non-Metropolitan State Areas found that a similar compilation of 1958 output represented 97.4 percent of the OBE sector output for that year (App. B, p. 65-3). Receipts by transportation enterprises in the United States as shown in Table 65 -1 and augmented as noted in the text by rents and royalties and

excises and inflated to reach the OBE level are shown in Table 65 -3. These receipts are allocated to the SMSA on the basis of estimated first quarter 1964 taxable payroll except for railroads, air transport and pipe line transportation for which no payroll data was available from County Business Patterns. Estimates of number of employees for air and pipe line transport could be made from County Business Patterns and for railroads from 1960 Population Census data (Volume 1, pp. 1-566 and 41-216).

Table 65 -3

ESTIMATE OF TRANSPORTATION OUTPUT PROVIDENCE SMSA 1963

	United States		Providence SMSA	
Type of Transportation	Est. 1963 Output ($000)	Taxable Payroll 1st Q 1963 ($000)	Est. Taxable Payroll 1st Q 1964 ($000)	Est. 1963 Output ($000)
Local passenger trans.	3,264,205	316,129	1,777	18,348
Trucking, warehousing	15,669,696	1,244,755	6,043	76,073
Water transportation	3,368,259	222,915	429	6,482
Air transportation	4,734,291	204,128[a]	164[a]	3,804
Pipe line	994,025	17,110[a]	3[a]	174
Transportation services	2,267,054	99,218	211	4,821
Railroads	11,744,073	941,214[a]	1,333[a]	16,633
TOTAL	42,041,603			126,335

a. Payroll figure for SMSA not published because of disclosure. Figure is number of employees, (see text).

I-O 66 Communications, Except Radio and Television Broadcasting

1. The Federal Communications Commission's Statistics of Communications Common Carriers, (hereafter referred to as FCC Statistics), provides authoritative information on interstate companies and on some of the intrastate companies. The coverage for telephone carriers is less complete than the coverage in County Business Patterns which was used for guidance in inflating FCC data to the proper I-O level.

2. The FCC Statistics for 1958 show Class A telephone carriers employment at 637,025 for October 31, 1958; this is 91.08 percent of the employment shown for telephone communications in County Business Patterns of 699,397 for the first quarter of 1959, (the nearest available time). If the FCC Statistics for operating revenues ($7,140,359,000), excises ($615,856,000) and uncollectibles ($25,849,000) are totalled and inflated to the employment level of the County Business Patterns, an estimate of $8,544,000,000 for output is obtained.

3. The telegraph employment shown in the FCC Statistics for October 1958 (44,802) substantially exceeds the telegraph communications employment shown in County Business Patterns (32,457). A similar excess occurs for other years, perhaps explained by non-coverage of some telegraph company employees by social security because of the close ties with railroads which are not covered. FCC Statistics can hardly over-report this item and hence is used here. Operating revenues ($318,010,000) and excises ($22,698,000) gives a total of $340,708,000.

4. The remaining segment of I-O 66, Communication Services, n.e.c. was shown to have 589 employees by the 1958 County Business Patterns. This was extrapolated to an estimate of $7,000,000 revenues leading to a total of $8,892,000,000 for revenues including excises and telephone uncollectibles for the part of I-O industry 66 reported in County Business Patterns or FCC Statistics. The 1958 I-O table gives an output of $9,292,000,000 which exceeds our compiled total by 4.5 percent. This is a reasonable estimate of state and local sales taxes. These 1958 figures provide a basis for inflating the reported 1963 totals to obtain estimates of the I-O output for the Providence SMSA in 1963.

5. The FCC Statistics for the year ended December 31, 1963, reported in Table 1 the operating revenues of telephone carriers for the United States at $10,160,654,000 and domestic telegraph carriers at $286,822,000. Allocation to the Providence SMSA was undertaken only for telephone carriers (over 97 percent of the total). This allocation was inflated in the final stage to allow for domestic telegraph carrier operations, and for the 4.5 percent difference between our compiled total and the 1958 I-O output. According to the same source (Ibid., Table 6) all but 100 phones in Rhode Island are operated by Bell companies, in this instance by New England Tel. & Tel. Both the Rhode Island Public Utility Commissioner's office and the office of the district manager of the New England Tel. & Tel. believed that all common carrier telephone service in the Providence SMSA is handled by the New England Tel. & Tel. It was also determined that New England Tel. & Tel. employment as reported in FCC Statistics is only slightly less than all the telephone communications employment reported in County Business Patterns for Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island, the area covered by the company. Since there is a substantial number of non-Bell company phones in states other than Rhode Island which are served by this company, and only a nominal 100 such phones listed for Rhode Island (apparently on Prudence Island which is outside the SMSA) there seems to be no reason why data for the Providence SMSA should be inflated for undercoverage. The only problem is the allocation of New England Tel. & Tel. operations to the Providence SMSA.

6. On December 31, 1963, New England Tel. & Tel. had 3,733,800 customer phones, 395,100 or 10.582 percent of them in Rhode Island. The ratio of telephone calls originating in Rhode Island to calls originating in New England, except Connecticut, (10.591 percent when weighted by revenue importance of local and toll calls) is comparable to the ratio of phones in Rhode Island. There seems to be no reason to expect the telephones per 100 population or the calls originating per telephone to be significantly different in the Massachusetts cities and towns included in the SMSA from the ratios for the part of

Rhode Island outside the SMSA. (About half of the population of each area is concentrated around an important city - Attleboro or Newport.) The relative populations of Rhode Island and the Providence SMSA were therefore used to estimate the number of phones in the SMSA from the number of phones in Rhode Island.

7. The 1960 population of the area covered by the SMSA in 1963 was 821,101 or 95.53 percent of the population of the state (859,488). It was hence estimated that 377,439 phones were in service in the Providence SMSA at the end of 1963, all operated by New England Tel. & Tel.--10.11 percent of all the phones operated by that company on that date. This figure provides a basis for measuring telephone services consumed in the SMSA.

8. Telephone services produced in the SMSA present the same conceptual problem faced in transportation and the same solution seems appropriate. Service is produced by people and equipment. The people work at or out of offices or service facilities with known locations. Services may be deemed to be produced at these locations and are assumed to be produced in proportion to the payroll for persons working at that location. The Rhode Island Department of Employment Security reports payroll for four quarters of 1963 for the Communications industry (SIC 48) as $20,002,633. County Business Patterns 1964, Rhode Island shows taxable telephone communications payroll (SIC 481) for the first quarter 1964 as 85.262 percent of all communications payroll (SIC 48). (Most of the balance is in radio broadcasting and television SIC 483.) Using this ratio, telephone communications payroll for Rhode Island for 1963 is estimated at $17,055,000. Using the population ratio of the State to the SMSA, payroll for the SMSA is estimated at $16,293,000. A few telephone communications employees in the SMSA are employed by American Telephone & Telegraph rather than New England Telephone & Telegraph but their productivity must be about the same per dollar of payroll. Telephone payroll for the SMSA is estimated to be 7.876 percent of that for New England Telephone and Telegraph.

9. Telephone operating revenues for 1963 for New England Tel. & Tel. were $476,145,000 to which uncollectibles of $1,497,000 and excises estimated at $41,662,700 are added to give a total of $519,305,000. (Excises collected in 1963 by all Class A telephone carriers were 8.750 percent of operating revenue and this ratio was used here.) This figure was then inflated to account for telegraph and communications services n.e.c., for state and local taxes and for any other undercoverage by using the ratio of the telephone output estimated in (2) above for 1958 ($8,544,000,000) to total output for I-O 66 ($9,292,000,000). The resulting estimate of $564,768,000 for I-O 66 output in this area covered by New England Telephone & Telegraph was allocated to the Providence SMSA by using the phones in service ratio developed in (7) and (8) above. The resulting estimate was $57,098,000 for consumption of services rendered by I-O 66 and $44,481,000 as I-O 66 output for the Providence SMSA.

I-O 67 Radio and TV Broadcasting

1. Total broadcasting revenues of radio and television stations, including networks, as reported to the FCC for 1958 were $1,553,100,000 and for 1963 they were $2,278,300,000 (FCC Annual Reports, 1959 p. 76 and 1964 p. 82). The national I-O for 1958 shows output of $1,549,000,000. In the absence of any explanation of the approximately one fourth of 1 percent difference in the estimated broadcast revenue for 1963 for stations in the Providence SMSA were used to indicate output of the industry. The FCC in Public Notice #58084 dated October 9, 1964, reported total broadcast revenues for AM and AM-FM stations for 1963 as $2,748,713.

2. National financial information is given for 3,832 AM and AM-FM stations and 294 FM stations. In the Providence SMSA there were 13 AM and AM-FM stations in 1963 and one FM station. The ratio between AM and AM-FM stations and FM stations is almost exactly the same nationally as in the Providence SMSA. Total AM and AM-FM revenue reported nationally was $[illegible]35,046,000; FM only revenue was reported

nationally as $11,400,000. Proportionate revenue in the Providence SMSA from the FM station, therefore, would be $49,343.

3. TV broadcasting revenue reported in Public Notice #54732 dated July 23, 1964, for the Providence SMSA is $7,300,522.

4. The total I-O 67 output for the Providence SMSA is estimated at $10,099,000.

I-O 68 Electric, Gas, Water and Sanitary Services

(Related SIC Code - 49)

SIC 491 Electric companies and systems
492 Gas companies and systems
493 Combinations companies and systems
494 Water supply
495 Sanitary services
496 Steam companies and systems
497 Irrigation systems

National Utility Statistics

In the accompanying table, national statistics were obtained for the years 1958 and 1963 in the electric, gas and water utility industries. The figures shown include amounts representing output of privately owned companies as well as data concerning publicly owned establishments. Since the output of publicly owned utilities represents primary output of federal, state, and local governments, these outputs are considered transfers from Sectors 78 and 79 to Sector 68 for distribution to consumers.

No figures were available for steam companies and systems and irrigation systems on a national level. Since no such system was located within the Providence SMSA, these figures were not specified in this report.

Only partial data was available concerning sanitary services. According to a local representative of this industry, it was impossible to obtain meaningful estimates of the output of privately owned

companies providing sanitary services. As a general estimate, it was suggested that output in 1963 might amount to $1 to $2 million in the Providence SMSA.

The total output shown in the 1958 Input-Output Study of the Office of Business Economics in Survey of Current Business, September, 1965, was $20,289,000,000, including transfers of $3,112,000,000. The sector output shown on the accompanying table is $18,876,270,469 or 93.04 percent of the OBE figures. In order to account for the data omitted from this report, therefore, it has been assumed that the statistics shown on the accompanying chart in items I, II, and III represent 93.04 percent of the output of the sector on a national level in 1958 and 1963.

1. The data for the electric utility industry, both private and publicly owned, include revenue derived from resale and exclude operating revenue other than revenue from electric operations. These figures were obtained from reports of the Federal Power Commission, Statistics of Electric Utilities in the United States; privately owned - 1958, p. xxix, 1963, p. xiv; publicly owned - 1958, p. x, 1963, p. ix. The amounts shown for cooperatively owned electric utilities do not include resale figures from one REA borrower to another (Statistical Abstract of the United States, 1960, p. 534; 1966, p. 535; U.S. Department of Agriculture Statistics, 1959, p. 527; 196[illegible], p. 525).

2. Inasmuch as the gas utility revenue quoted in the American Gas Association Monthly (January 1960, p. 5, January 1965, p. 4 and 5) included only revenue from sales to final customers, resale figures were determined from data provided by the AGA Bureau of Statistics in Gas Facts 1964, p. 126. The 1963 amount shown is an accurate one while the 1958 figure is an estimate based upon the proportionate difference between the 1955 and 1960 amounts.

3. While no exact figures were available on an industry basis, the privately owned water utility revenues for selected companies was estimated by the American Water Works Association and reported in Moody's Public Utility Manual, 1964, p. a87. The publicly owned portion of the industry was reported in the Compendium of City Government Finances, 1958 and 1963, prepared by the U.S. Department of Commerce, Bureau of the Census.

4. Municipal government revenue for sanitary services other than sewerage was reported for the year 1963 by the Census Bureau in the above mentioned Compendium. Data was not specified for the year 1958, however; and, in the absence of an appropriate method of estimating this amount, it was omitted from the accompanying report. The expansion figure shown on the accompanying table does take into account the 1963 figure for sanitary services provided by municipal governments.

5. No attempt was made to estimate sales taxes not included in operating revenue of reporting utilities. Inasmuch as no breakdown of receipts was given in 1958 tax data, rents and royalties of utilities have not been included for 1958. In U.S. Business Tax Returns, 1963, p. 167, the Internal Revenue Service reported corporate rents and royalties for utilities as $51,886,000. This amount was also consider a portion of the 6.96 percent expansion of 1963 figures.

Statistics for the Providence SMSA

1. Data concerning privately owned electric utility companies were obtained from the following publications: Moody's Public Utility Manual, 1964; F.P.C. Statistics of Electric Utilities in the United States - privately owned, 1963. Information about municipal electric utilities was taken from F.P.C. statistics in the case of the North Attleboro Municipal Light Co. and from 1962 census figures in the case of the Pascaag Fire District. No federal nor cooperative projects were included in the SMSA.

In this report output was deemed to occur at the site of generation except when separate companies purchased power for distribution. Apparently no generation of electricity took place in the Massachusetts portion of the SMSA. Output was not allocated to this portion of the SMSA with the exception of the resale amount purchased by the North Attleboro Municipal Light Co. In Rhode Island operating revenues of the Blackstone Valley Electric Company and Pascaag Fire District were considered output of the SMSA. Except for a small portion of the revenue of Narragansett Electric Company ($125,356, an estimate of revenue derived from the one generating plant located outside the SMSA),

operating revenue of this company was included in the output of the SMSA. All operating revenues include resale revenues.

2. Since the gas utility industry in the Providence SMSA is primarily the distribution of purchased natural gas, output is considered in this report to be related to distribution to ultimate customers in the SMSA, not to wholesale purchases of gas. Output, therefore, is assumed to be revenue from final users of gas. Sales of interstate transmission companies were considered to occur outside the Providence SMSA. (The actual transfer occurs within the SMSA but is shown as an import.)

All operating revenues of the Providence Gas Company and the Valley Gas Company were included in the output of the SMSA. From this revenue total and population of the areas covered by these companies, an average revenue per capita of $28.75 was calculated. By multiplying this average by the population of the Massachusetts portion of the SMSA and of Bristol and Warren, 113,063, a figure was developed which estimated the remaining portion of the output of this industry in the SMSA.

Information concerning the privately owned gas utilities was obtained from Moody's Public Utility Manual, 1964. No publicly owned gas utility was located in the SMSA.

3. The operating revenue of the only privately owned water company in the Providence SMSA, Bristol County Water Company, was taken from Moody's Public Utility Manual, 1964, p. 15. The total revenue of publicly owned water systems was given for the SMSA in 1962 Census of Governments, U.S. Bureau of Census, part V, p. 261.

4. As calculated for Sector 70, output of the municipal sanitary services was estimated on the basis of statistics supplied in the 1962 Census of Governments. By calculating the percentage of revenue to expenditures, other than capital outlay, by state, it was possible to estimate revenue derived from within the SMSA. The expansion figure shown is not of the output estimated for sanitary services provided by municipal governments.

5. A portion of the national rents and royalties shown for 1963 has been allocated to the Providence SMSA on the basis of 1964 first quarter payroll figures of SIC 49 published by the U.S. Department of Commerce, Bureau of the Census, in County Business Patterns, 1964. The national payroll, $1,001,298,000, was compared to the Rhode Island payroll, $5,233,000, and a coefficient developed of .0052. This coefficient, when applied to the national rent and royalty output, $51,886,000, has provided an estimate of State output derived from utility rents and royalties. The output of the State has been assumed to be a close approximation of the output of the SMSA, inasmuch as the two major utilities, Narragansett Electric Company and Providence Gas Company, are located almost entirely in the Rhode Island portion of the SMSA. This amount has also been deducted from the expansion figure as mentioned below.

6. Since there were no steam companies and systems nor irrigation systems located within the SMSA, the expansion of the compiled output was to cover only private sanitary services and miscellaneous undercoverage, therefore, the output calculated for the Providence SMSA was not expanded as much as the undercoverage found for the nation as a whole. The output of Sections I, II, and III was deemed in this report to be 97.68 percent of the total estimated output. (The expansion figure was calculated as one third of the 6.9 percent expansion percentage needed for national data, i.e., 32 percent.)

Sector 68

	U.S.A. - 1958	U.S.A. - 1963	Providence SMSA - 1963
I. Electric Utility Industry			
A. Privately Owned A & B Class Companies	$ 8,708,578,432	$12,018,473,940	$55,789,476
B. Publicly Owned			
1. Municipal, Power Districts and State Projects	701,357,493	1,298,890,000	1,114,902
2. Federal Projects	410,507,943	448,052,000	--
C. Cooperative (R.E.A.)	571,293,000	745,629,000	--
II. Gas Utility Industry			
A. Privately Publicly Owned			
1. Natural Gas	4,219,543,000	6,482,560,000	23,849,293
2. Manufactured and Mixed Gas	332,632,000	235,923,000	--
3. Liquified Petroleum Gas	16,146,000	8,332,000	--
B. Sales from Resale	2,564,558,600	3,849,621,000	--
III. Water Utility Industry			
A. Privately Owned	114,654,000	159,444,000	763,764
B. Publicly Owned	1,237,000,000	1,865,000,000	7,969,000
Partial Total	$18,876,270,468	$27,111,924,940	$89,486,435
IV. Sanitary Services-- Other than Sewers			
A. Privately Owned	--	--	--
B. Municipal Revenue	--	163,000,000	120,120
V. Steam Companies & Systems	--	--	--
VI. Irrigation Systems	--	--	--
VII. Rents and Royalties	--	51,886,000	269,807
VIII. Expansion Figure	1,412,729,532	1,813,263,157	1,735,467
Total Estimated Output	$20,289,000,000	$29,140,074,097	$91,611,829

E. WHOLESALE AND RETAIL TRADE

I-O 69 Wholesale and Retail Trade

The output of this industry is defined by special convention as the gross margin of trade establishments including commissions, sales and excise taxes and import duties. Manufacturers sales offices are not included as their sales and margins are deemed to be included in the value of shipments reported by manufacturers.

The Census of Business reports sales of trade establishments but does not report margins in general. It does report operating expense ratios for most types of wholesaler for many different kinds of product and for the 1963 Census made a study of margins for merchant wholesalers--the most important type of wholesaler. Operating expense ratios vary widely for different types of wholesalers handling the same products and for any one type of wholesaler according to kind of product handled. In order to estimate total margins, estimates of sales and margins by type of wholesaler and kind of product sold were made for the Providence SMSA.

Wholesaling margins for merchant wholesalers selling forty kinds of products were obtained from a special study made in connection with the 1963 Census of Business entitled Measures of Value Produced in and by Merchant Wholesaling Firms, 1963. Total sales by each of these kinds of merchant wholesalers was given by the Census of Business or could be estimated (usually from data for the State of Rhode Island) through allocations made within the framework of control totals. Total sales of $702,694,000 by merchant wholesalers in the Providence SMSA in 1963 were estimated in this way to have had margins of $127,747,400.

Table 69 -1

SALES BY WHOLESALERS, PROVIDENCE SMSA
AND STATE OF RHODE ISLAND, 1963

Types of Wholesalers	Page No. for data	Prov. SMSA Amount ($000)	State of R.I. Amount ($000)
All	41-8	1,212,653	
	41-6		1,198,773
Merchant wholesaler	41-8	702,694	
	41-6		695,220
Other operating types	41-8	509,959	
	41-6		503,553
Petroleum bulk stations, terminals	41-8	159,104	
	41-6		165,209
All, except merchant wholesalers and petroleum bulk stations	diff.	350,855	
	"		338,344
All, except merchant wholesalers, mfgs., sales offices and petroleum bulk stations	5-119	255,681	
Mfgs. sales offices	diff.	95,174	
Agents and brokers	est.	60,000[a]	
	41-7		53,301
Petroleum bulk plants and terminals and assemblers of farm products	41-7		172,528
Assemblers of farm products	est.	7,000[a]	
	diff.		7,519
Mfgs. sales branches	est.	188,681[b]	
Mfg. sales branches and offices	est.	283,855	
	41-7		277,724

a. Estimated from state figures.
b. Balance after subtracting estimates for agents and brokers and assemblers of farm products.

Sales by other types of wholesalers were reported by the Census as $509,959,000. The division of this amount between manufacturers sales branches, manufacturers sales offices, petroleum bulk stations and terminals, agents and brokers and assemblers of farm products was accomplished as shown in Table 69-1 partly by taking differences and to a limited extent by estimating from data available for the State but not for the SMSA. The page number of the Census of Business, Wholesale Trade, 1963 is shown for all entries except differences or estimates.

Estimates of the sales in the Providence SMSA by merchant wholesalers of the different kinds of products were made using both SMSA and State data especially from pages 41-6, 41-7, 41-8, 4-81, and 4-82. Estimates were also made for manufacturers sales branches, for manufacturers offices, for petroleum bulk stations and terminals, and for a group of all other types which consists of agents and brokers and assemblers of farm products. This was done by allocating a figure generally given either for the SMSA or the State by the Census--the sales by all these types together for each kind of product in proportion to sales of that kind of product in the US by each of the three types of wholesalers--and then by adjusting these estimates to the previously developed totals for each type of wholesaler. The resulting estimates are shown in Table 69-2.

Estimates of percentage margins for manufacturers branches for petroleum bulk stations and terminals, and for the "all other" category were developed for each kind of product by comparing operating cost ratios given for the different types of wholesalers with those for merchant wholesalers and with the margins for merchant wholesalers. These margins were applied to the estimates of sales to obtain estimates of margins in dollars. (The information on operating expenses for different types of wholesalers of various products is given on pages 9-83 through 9-91 of the Census of Business, Wholesale Trade, 1963.) For petroleum bulk stations and terminals no operating expense ratio is given so operating expenses were estimated by applying the ratio of payroll to operating expenses for all

manufacturers sales branches (with stocks) to the payroll reported for petroleum bulk stations and terminals for the Providence SMSA. The resulting estimate of operating expenses, $11,801,000, was inflated to an estimated margin by using the ratio of operating expenses to margin for all merchant wholesalers. The resulting estimate was $15,800,000. No margins were computed for manufacturers sales offices but an estimate of their sales, which is part of the sales total for the SMSA given by the Census for all types except merchant wholesalers (page 41-8), was developed.

All these estimates are shown in Table 69-2.

For retail trade margins were determined for fourteen sorts of merchandise; it was not feasible to determine separate margins for type of retailer. Margins were determined from the information on business receipts and cost of goods sold shown in U.S. Business Tax Returns 1963. These business receipts ordinarily exclude sales taxes and any excise taxes remitted to the taxing authority by the retail trade establishment. The Census reports sales including such taxes. It was, therefore, necessary to develop estimates of sales less taxes. This in turn required estimation of the sales outside the Rhode Island sector of the SMSA because Massachusetts had no sales tax in 1963. Population outside the state is 10.9 percent, so sales outside the State were estimated in general to be in a slightly higher proportion, usually 12 percent, except for a few lines in which tax dodging is notoriously concentrated. For eating and drinking places no allowance was made because a special Massachusetts tax on meals of $1 or over was roughly equivalent to the Rhode Island tax.

I-O Sector 75 includes some activities of automotive group retailers. Margin on sales of parts and accessories sold installed by retailers in the automotive group and labor services sold by this group must be subtracted from the gross margin figured in Table 69-3.

The total output of the sector includes customs duties and local sales taxes. An estimate of customs duties based on the ratio of retail sales in the SMSA to such sales nationally resulted in a figure of $6,062,000. Sales subject to tax were reported for the

Table 69-2

SALES AND MARGINS BY TYPE OF WHOLESALER AND KIND OF PRODUCT SOLD, PROVIDENCE SMSA 1963

Kind of Product Sold	All Types		Merchant Wholesalers			Mfg. Branches			All Other Types			Mfg. Offices
	Total Sales	Average Margin	Sales	Margin Percent	Margin ($000)	Sales	Margin Percent	Margin ($000)	Sales	Margin Percent	Margin ($000)	Sales
Automobiles, other motor vehicles	23,148	11.1	10,901	16.4	1,787.8	8,804	4.7	413.8	229	4.0	9.2	3,214
Automotive equipment	18,960	29.6	18,191	30.1	5,475.5	444	21.1	93.7	203	6.1	12.4	122
Tires, tubes	5,049	28.2	5,049	28.2	1,423.8	a/	---	---	---	---	---	---
Drugs, drug propr., drug, sund.	23,180	19.2	23,180	19.2	4,450.6	---	---	---	---	---	---	---
Paints, varnishes	3,604	26.0	1,445	28.7	414.7	1,677	25.8	432.7	163	5.0	8.2	319
Other chemicals, allied products	109,858	17.3	25,988	23.0	5,977.2	41,052	16.0	6,012.0	2,963	4.4	130.4	39,855
Dry goods, piece goods, notions	30,440	13.7	16,430	17.0	2,793.1	1,999	12.2	243.9	4,857	3.2	155.4	7,154
Apparel, accessories, hosiery, lingerie, footwear	7,783	20.5	7,580	20.7	1,569.1	55	20.1	11.1	84	4.2	3.5	64
General line groceries	25,300	8.0	25,300	8.0	2,024.0	---	---	---	---	---	---	---
Specialty-line groceries	64,062	13.0	40,413	14.9	6,021.5	9,427	14.0	1,319.8	8,894	3.5	311.3	5,328
Confectionery	8,502	15.5	6,802	16.5	1,122.3	570	10.2	58.1	412	6.1	25.1	718
Meat, meat products (incl. poultry)	73,002	9.5	44,868	10.9	4,890.6	19,527	9.3	1,881.1	8,476	1.7	149.2	131
Fresh fruit and vegetable	28,143	12.7	23,701	17.5	4,147.7	---	---	---	4,442	5.8	257.6	---
Farm products (raw materials)	41,070	5.7	41,070	5.7	2,341.0	---	---	---	---	---	---	---
Electric supplies, apparatus	27,191	14.9	15,890	17.2	2,733.1	7,797	11.0	857.7	922	8.2	75.6	2,582
Electric appliances, T.V., radio sets	26,709	16.1	25,709	15.6	4,010.6	638	18.6	118.7	165	6.2	10.2	197
Electronic parts, equipment	5,289	26.8	5,000	27.4	1,370.0	53	13.2	7.0	119	7.6	9.0	117
Hardware	7,916	22.8	7,916	22.8	1,804.9	---	---	---	---	---	---	---
Plumbing and heating equip. and supp.	12,959	18.0	8,959	20.1	1,800.8	614	14.1	86.6	1,680	8.5	142.8	1,706
Air cond., refrig. equip. and supp.	4,880	28.2	4,880	28.2	1,376.2	---	---	---	---	---	---	---
Commer., indus. mach., equip., supp.	84,825	24.7	48,555	25.7	12,478.3	23,403	25.7	6,014.6	4,986	10.0	498.6	7,881
Professional equip., supplies	7,831	31.0	7,000	31.3	2,191.0	566	29.5	176.0	123	12.4	15.3	142

Table 69-2 (Continued)

Kind of Product Sold	All Types		Merchant Wholesalers			Mfg. Branches			All Other Types			Mfg. Offices
	Total Sales	Average Margin	Sales	Margin Percent	Margin ($000)	Sales	Margin Percent	Margin ($000)	Sales	Margin Percent	Margin ($000)	Sales
Service estab. equip., and supp.	4,750	30.2	4,550	30.7	1,396.9	86	26.2	22.5	89	8.5	7.6	25
Transp. (exc. auto) and farm and garden equip.	1,404	23.0	1,404	23.0	322.9	---	---	---	---	---	---	---
Metals, minerals (exc. petrol. prod. and soap)	48,774	14.9	27,901	18.9	5,273.3	11,017[b]	6.3	694.1	1,751[b]	4.8	84.0	8,105[b]
Petroleum bulk stations, terminals	159,104	9.9	none	---	---	---	---	---	159,104[c]	9.9	15,800[c]	---
Iron steel scrap	13,243	23.5	13,243	23.5	3,112.1	---	---	---	---	---	---	---
Waste materials	19,547	24.2	19,547	24.5	4,730.4	---	---	---	---	---	---	---
Tobacco, tobacco prod.	29,000	20.1	28,126	20.1	5,653.3	205	19.1	39.2	52	17.1	8.9	617
Beer	22,557	19.7	21,195	19.9	4,217.9	617	13.5	83.3	70	8.4	5.9	675
Wine, distilled spirits	19,805	22.2	19,805	22.2	4,396.7	---	---	---	---	---	---	---
Paper	27,525	21.2	10,225	18.5	1,891.6	4,999	15.2	759.8	1,186	4.0	47.4	13,715
Stationery, office supp.	10,000		7,400	31.9	2,360.6							
Furniture, household, office	3,490	20.4	1,718	25.7	441.5	650	16.2	105.3	493	7.7	38.0	629
Home furnishings	6,095	25.2	6,095	25.2	1,535.9	---	---	---	---	---	---	---
Lumber, millwork	26,032	17.7	23,532	13.8	3,247.4	1,527	14.6	222.9	595	5.2	30.9	1,878
Construction materials	16,156		14,656	24.7	3,620.0							
Amusement, sporting goods	11,448		5,678	23.3	1,323.0							
Farm supplies	7,428	16.2	4,428	15.1	668.6	52,954	15.2	8,471.1	24,046	3.8	902.3	-0-[d]
Jewelry	56,577		24,577	22.8	5,603.6							
Other	90,017		53,787	19.4	9,896.8							
TOTAL	1,212,653	14.7	702,694		131,896.6	188,681		29,125.0	67,000		2,938.8	95,174

a. ---Indicates no sales by this type of wholesaler.
b. Estimate from Rhode Island and New England figures on metals service centers and metals sales offices rather than national figures (pp. 9-84 and 9-85).
c. Not included in column total.
d. No allocation to manufacturers sales offices made for other miscellaneous products because the census gives no breakdown nationally.

Table 69-3

RETAIL SALES AND MARGINS, 1963 PROVIDENCE SMSA

	Sales per 1963 Census ($000)	Sold in R.I. but not Taxed	Sold in Mass. Section not Taxed	Sales ex-tax ($000)	Margin Percent	Margin ($000)
Building materials dlrs.	33,880		12%	33,012	24.99	8,250
Hardware store	6,938		12%	6,760	27.91	1,887
Farm equipment dlrs.	1,508		12%	1,469	16.36	240
General merchandise stores	145,684		12%	141,950	33.95	48,175
Food stores	276,214	230,000	12%	275,029	19.49	53,603
Automobile and truck dlrs.	158,162		15%	154,246	12.95	19,975
Gasoline service stations	57,738	45,000	12%	57,412	21.16	12,148
Tire, battery, accessory stores	12,276		20%	11,990	25.41	3,047
Apparel and accessory stores	78,188		15%	76,252	34.00	25,926
Furniture and home furnish. and equip.	46,357		25%	45,344	33.41	15,149
Eating and drinking places	80,597		0%	78,250	47.93	37,505
Drug and proprietary stores	41,732	26,000	12%	41,329	32.05	13,246
Liquor stores	27,259		12%	26,560	19.87	5,277
Other retail trade	118,785		12%	115,740	31.73	36,724
TOTAL						281,152
			Less margin on installed parts and accessories			2,816
						278,336
			Less labor services of automotive group			8,798
						269,538

cities and towns in the Rhode Island part of the SMSA as $882,448,000 on which $26,473,000 of sales tax was due. A summary of sector output is shown in Table 69-4

Table 69-4

OUTPUT OF PARTS OF SECTOR 69

	($000)
Wholesale Trade	$162,960
Retail Trade	269,538
Federal Customs Duty	6,062
Sales Tax	26,473
	$465,033

F. FINANCE AND INSURANCE

I-O 70 Finance and Insurance

SIC 60 Banking

- SIC 601 Federal Reserve Banks
- 602 Commercial and stock savings banks
- 603 Mutual savings banks
- 604 Trust companies not engaged in deposit banking
- 605 Establishments performing functions closely related to banking

SIC 61 Credit agencies other than banks

- SIC 611 Rediscount and financing institutions for credit agencies other than banks
- 612 Savings and loan associations
- 613 Agricultural credit institutions
- 614 Personal credit institutions
- 615 Business credit institutions
- 616 Loan correspondents and brokers

SIC 62 Security and commodity brokers, dealers, exchanges, and services

- SIC 621 Security brokers, dealers, and flotation companies
- 622 Commodity contracts brokers and dealers
- 623 Security and commodity exchanges
- 628 Services allied with the exchange of securities or commodities

SIC 63 Insurance carriers

- SIC 631 Life insurance
- 632 Accident and health insurance
- 633 Fire, marine and casualty insurance
- 635 Surety insurance
- 636 Title insurance
- 639 Insurance carriers, n.e.c.

SIC 64 Insurance agents, brokers, and service

SIC 66 Combination of real estate, insurance, loans, law offices

SIC 67 Holding and other investment companies

- SIC 671 Holding companies
- 672 Investment companies
- 673 Trusts
- 679 Miscellaneous investing institutions

1. SIC 60 Banking

The source of data used, on a national and state level, in estimating the output of commercial and stock savings banks, mutual savings banks, and trust companies not engaged in deposit banking was the Annual Report of the Federal Deposit Insurance Corporation, 1958 and 1963, Federal Deposit Insurance Corporation.

Output of insured commercial and stock savings banks was construed to be current operating revenue less interest on deposits and interest on other borrowed money. This amount represents "the value of services for which monetary income is received as well as imputed values for services furnished without explicit charges."[1]

The output for insured banks was expanded to include an approximation of the output of non-insured commercial banks and trust companies. F.D.I.C. data revealed that of the total deposits of all commercial and stock savings banks and trust companies in 1958, 99 percent were insured; in 1963, 99.4 percent were insured. In Rhode Island 93.1 percent were insured in 1963.

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1. The 1958 Interindustry Relations Study, U.S. Department of Commerce, Office of Business Economics, National Economics Division, (November 1964), SIC 70 (pages 18 and 19).

Expanded output, therefore was calculated as follows:

	U.S. 1958	U.S. 1963	R.I. 1963
Insured commercial and stock savings banks:			
Total operating revenue	$8,500,949,000	$13,509,713,000	$54,875,000
Less: Interest on deposits and borrowed money	1,404,736,000	3,570,825,000	15,419,000
	$7,096,213,000	$9,938,888,000	$39,456,000
Ratio to all commercial bank and trust deposits	99.0%	99.4%	93.1%
Expanded total output	$7,167,891,919	$9,998,881,287	$42,380,236

The expanded total output for the State of Rhode Island was estimated by applying to state figures the state ratio of insured commercial bank deposits to all commercial banks (there were no uninsured trust companies in Rhode Island).

For the purpose of this report, the assumption has been made that the output of Providence SMSA banks was made up of income of approximately one-half personal accounts and one-half business accounts. According to the 1960 Census of Population, the proportion of population in the Providence SMSA was .9553 of the population in the State of Rhode Island. On the other hand, as indicated by statistics found in the 1963 Census of Manufacturers the proportion of the value added by manufacturer, adjusted, in the Providence SMSA was 1.1217 of the value added in the State of Rhode Island. Inasmuch as business accounts are concentrated in the City of Providence, the expanded output for the State of Rhode Island has been accepted as an estimate for the Providence SMSA.

In the case of mutual savings banks and Federal Reserve Banks, etc., "imputed interest is derived by deducting profits, in addition to dividends and monetary interest paid, from dividends and monetary interest received."[2] Output of mutual savings banks, therefore, was calculated as current operating income less the following amounts:

2. Ibid.

federal and state franchise and income taxes, dividends and interest on deposits, and net additions to total surplus accounts from operations.

These amounts were also expanded to take into account the number of uninsured mutual banks. In 1958, 80.1 percent of the deposits of all mutual savings banks were insured; in 1963, the percentage was 86.8 percent. All of the mutual savings banks in Rhode Island were insured.

Output was calculated and expanded as follows:

Mutual Savings Banks	U.S. 1958	U.S. 1963	R.I. 1963
Insured companies current operating revenue	$1,149,643,000	$1,946,776,000	
Less: Taxes, dividends, profits	948,193,000	1,683,706,000	
	$ 201,450,000	$ 263,070,000	
Ratio to all mutual bank deposits	80.1%	86.8%	100%
Expanded total output	$ 251,498,127	$ 303,076,037	$4,546,141

As with the commercial and stock savings banks, the state output has been assumed a good estimate for the Providence SMSA.

Although current operating revenue, etc., was not specified by the F.D.I.C. for mutual savings banks by individual states, the total deposits in mutual banks for the United States and Rhode Island were given, $44,516,295,000 and $667,792,000 respectively. Output for the State of Rhode Island was estimated by applying the ratio of deposits, .0150 to the national output, $303,076,037. The resultant estimate of output for the Providence SMSA, therefore, was $4,546,141.

To complete this industry on a national basis, the outputs of Federal Reserve Banks, Board of Governors Federal Reserve Bank, Federal Home Loan Banks and Federal Land Banks were added to the above figures. No district offices or branches of the above were located in the Providence SMSA and hence no output was allocated from these banks to the SMSA.

The output of Federal Reserve Banks and the Board of Governors of the Federal Reserve System were established on the basis of data provided in the Fiftieth Annual Report of the Board of Governors of the Federal Reserve System, 1963, and the Forty-Fifth Annual Report, 1958.

The national output for the years 1958 and 1963 was calculated as follows:

Federal Reserve Banks

	U.S. 1958	U.S. 1963
Total current earnings	$742,068,150	$1,151,120,060
Less:		
Dividends paid	21,197,452	28,912,019
Paid Treasury (Interest on F.R. notes)	524,058,650	879,685,219
Transferred to surplus (NET)	59,210,912	55,864,300
Output	$137,601,136	$186,658,522

Federal Reserve Bank--Board of Governors

1958

Total assessments levied on Federal Reserve Banks	$10,686,700
Plus: Excess of expenditures over assessments for year	1,147
1958 Output	$10,687,847

1963

Total assessment levied on Federal Reserve Banks	$15,913,070
Less: Excess of assessments over expenditures for year	137,329
1963 Output	$15,775,741

The output of Federal Home Loan Banks was measured by data supplied in the Annual Report, 1958 and 1963 of the Federal Home Loan Bank Board.

Federal Home Loan Banks

Total operating income	$62,894,712	$179,695,308
Less:		
Interest on consolidated operations	20,270,267	95,177,570
Interest on members' deposits	16,099,277	27,000,779
Net income (operating and nonoperating)	22,949,282	47,922,865
Output	$ 3,575,886	$ 9,594,094

The data pertaining to Federal Land Banks was obtained from the Federal Home Loan Bank Board Annual Report, 1958 and 1963. Fiscal reporting dates of June 30th were taken into consideration by averaging the 1958 and 1959 figures and the 1963 and 1964 figures. These average amounts are presented below.

Federal Land Banks

	1958	1963
Total earnings	$93,200,342	$168,292,552
Less:		
Interest and other costs of bonds	57,999,102	112,793,692
Other interest expense	2,359,205	3,601,839
Transfers to legal reserve	3,831,130	11,652,847
Transfers to surplus reserve	127,500	195,000
Dividends declared	5,576,529	13,611,443
Net addition to surplus	692,188	3,625,460
Output	$22,614,688	$ 22,812,271

Industry 60 Banking

Output	U.S. 1958	U.S. 1963	Providence SMSA 1963
I. Commercial and stock savings banks and trust companies	$7,167,891,919	$9,998,881,287	$42,380,236
II. Mutual Savings Banks	251,498,127	303,076,037	4,546,141
III. Federal Reserve Banks	137,601,136	186,658,522	---
IV. Federal Reserve Banks-Board of Governors	10,687,847	15,775,741	---
V. Federal Home Loan Banks	3,575,886	9,594,094	---
VI. Federal Land Banks	22,614,688	22,812,271	---
TOTAL	$7,593,869,603	$10,536,797,952	$46,926,377

2. SIC 61 Credit Agencies Other Than Banks

Since only the non-financial expenses of savings and loan associations are being considered in the measurement of output, output of savings and loan associations is defined as gross operating income less the following amounts: interest, dividends, and income tax paid as well as net additions to surplus or reserves.

As of December 31, 1963, the 4,960 savings and loan associations which were members of the Federal Home Loan Bank System held $105,457,666,000 of assets, or slightly over 98 percent of the assets of the entire savings

and loan industry.[3] It has been assumed, therefore, that the output calculated for member associations represents approximately 98 percent of the national output of all these enterprises.

The Federal Home Loan Bank Board in Combined Financial Statements, 1958 and 1963 has reported income and expenses of member associations both on a national level and for the Providence SMSA.

Output of savings and loan associations was calculated as follows:

	U.S. 1958	U.S. 1963	Providence SMSA-1963
Gross operating income	$2,570,598,000	$5,603,673,000	$17,347,000
Less:			
Interest charges	35,125,000	130,617,000	326,000
Federal income tax	5,625,000	93,054,000	228,000
Dividends	1,467,415,000	3,505,243,000	11,390,000
Net income to:			
Surplus	20,799,000	188,998,000	181,000
Reserve	455,456,000	493,163,000	1,001,000
Output	$ 586,178,000	$1,192,598,000	$ 4,221,000

According to the OBE,[4] the "output of Agricultural Credit Institutions is measured by their loan service fees, compensation under CCC programs, and income from the Federal Land Banks."

The Cooperative Farm Credit System, supervised by the Farm Credit Administration, is subdivided into three types of credit institutions.[5] Long-term farm mortgages are processed through Federal Land Banks by land bank associations. Operating capital is obtained from production credit associations which in turn obtain funds from Federal intermediate credit banks. Farmers' marketing, purchasing, and business service cooperatives obtain credit funds from banks for cooperatives.

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3. Combined Financial Statements, 1963, Members of the Home Loan Bank System, Federal Home Loan Bank Board(page 4).

4. The 1958 Interindustry Relations Study, U.S. Department of Commerce, Office of Business Economics, National Economics Division, November 1964, SIC 70 (page 18 and 19).

5. 31st Annual Report of the Farm Credit Administration, 1963-64, Farm Credit Administration, (page 5).

The 31st Annual Report of the Farm Credit Administration is the source of the following national statistics. No Federal Land Bank Association member nor Production Credit Association member nor farmers' cooperative was listed by the FCA as being located in the State of Rhode Island. No output was allocated, therefore, to the Providence SMSA.

All amounts shown below are averages of the figures supplied for the years ending June 30, 1958 and 1959 and June 30, 1963 and 1964 in order to take in account the mid-year fiscal dates.

No figures are included for banks for cooperatives because all net earnings are distributed to surplus and are allocated to patrons of the banks, paid in taxes or as dividends to farmer cooperatives.

Federal Land Bank Associations

	U.S. 1958	U.S. 1963
Applications and FLB		
Closed loan fees	$ 724,435	$ 1,341,478
FLB compensation	10,938,362	13,139,902
Output	$11,662,797	$14,481,380

Production Credit Associations

	U.S. 1958	U.S. 1963
Loan service fees	$5,987,313	$7,766,101
Compensation for services under CCC program	30,974	3,162
Output	$6,018,287	$7,769,263

Federal Intermediate Credit Banks are not included in this sector since they do not lend money directly to farmers and do not engage in a general banking business. They are merely a source of funds at wholesale.

The OBE definition of output for personal and business credit agencies is "receipts other than business and interest receipt since their business receipts are treated as monetary interest received."[6]

6. The 1958 Interindustry Relations Study, Op. Cit., pp. 18-19.

The 1958 and 1963 Report of Operations Federal Credit Unions reported the data upon which the following estimate of output of federal and state credit unions is based.

The measurement of output has been established in this report as gross income plus interest refund minus interest and dividends paid.

Federal Credit Unions

	U.S. 1958	U.S. 1963	R.I. 1963
Gross Income	$148,027,150	$307,783,216	$198,397
Plus: Interest Refund	4,369,472	12,625,292	3,737
	$152,396,622	$320,408,508	$202,134
Less: Interest on Borrowed Money	1,486,657	3,245,410	721
Dividends Paid	63,083,206	137,158,592	104,423
Output	$ 87,826,759	$180,004,506	$ 96,990

In order to estimate output of state-chartered credit unions on a national basis, loans outstanding to members at the end of the year of both state and federal credit unions were compared. According to Statistical Abstract of the United States, 1965, page 470, the 9,740 state-chartered credit unions and the 9,030 federal credit unions reported loans outstanding on December 31, 1958, in the amount of $1,698 million and $1,380 million, respectively. A ratio of these loans was calculated, 1.2304, and applied to the output shown for federal credit unions in 1958, $87,826,759, to estimate the national output of state-chartered credit unions in 1958, $108,062,044.

The 10,362 state credit unions in 1963 reported loans outstanding to members in the amount of $3,259 million; the 10,955 members of federal credit unions reported loans to be $2,911 million. The ratio of these amounts, 1.1195, was then applied to the 1963 output of federal credit unions, $180,004,506, in order to estimate the 1963 national output of state credit unions, $201,515,044.

According to the Fifty-Seventh Annual Report of the Banking Division, 1964, Department of Business Regulation, State of Rhode Island and Providence Plantations, total loans amounted to $74,027,618 in Rhode Island state-chartered credit unions as of December 31, 1963.

As reported in the 1963 Report of Operations, Federal Credit Unions in Rhode Island amounted to $1,507,039 as of December 31, 1963.

The ratio of loans in state-chartered credit unions in Rhode Island to the loans of federally-chartered credit unions in Rhode Island was calculated to be 49.1212. The product of this ratio and the output estimated for federal credit unions in Rhode Island, $96,990, represented the output of state-chartered credit unions in Rhode Island, $4,764,265.

For the most part, credit unions in the State of Rhode Island are located in the metropolitan area and are largely credit unions of employee groups. For these reasons, the state figures mentioned above have been expanded by the coefficient of value added by manufacture, adjusted, of the SMSA to the state, 1.1217. The estimate of output of federal credit unions in the Providence SMSA, therefore, is $116,388; the output of state-chartered credit unions was estimated to be $5,344,076.

The Rhode Island Department of Business Regulation, Banking Division, in its Fifty-Sixth and Fifty-Seventh Annual Report, reported loans including hypothecated investment certificates of seven loan and investment companies in Rhode Island, all located within the Providence SMSA, as $7,955,768 in 1964 and $8,001,017 in 1963. Because the reporting dates of these companies were June 30th, the fiscal year totals were averaged to establish a loan value for the calendar year 1963, $7,978,392. Since no evidence was found of any loan and investment company in the Massachusetts portion of the Providence SMSA, the amount of loans outstanding for the calendar year 1963 was considered the figure pertaining to the SMSA.

The Federal Home Loan Bank Board in its Combined Financial Statements, 1963, reported first mortgage and other loans of savings and loan associations within the Providence SMSA in 1963, as $325,628,000.

The ratio of loans of loan and investment companies to loans of savings and loan associations was calculated to be .0245. In the absence of more detailed information, output of loan and investment companies in this report has been estimated as the product of this ratio and the output of savings and loan association output.

Thus, the estimated output of loan and investment companies in 1958 was calculated as the product of .0245 and $586,176,000 or $14,361,312, the 1963 national output as the product of .0245 and $1,192,598,000, or $29,218,651. Output for the Providence SMSA was estimated as .0245 multiplied by $4,221,000 or $103,414.

The above estimates, of course, assume that the relationship of loans outstanding of loan and investment companies and savings and loan associations is a valid indication of the relationship of output and that the relationship existing in the Providence SMSA is typical of the country as a whole.

The output shown for this industry is incomplete because sources of further information are not available at this time. The accompanying chart, therefore, does not include figures for licensed small loan lenders and installment sales finance institutions under the heading "Personal Credit Institutions." Output of business credit institutions and loan brokers and correspondents has also been omitted from this report.

When total national figures are compared to OBE totals for 1958, however, the deletion of these figures will be affected by the expansion of statistics for the entire sector (see section VIII of this report).

INDUSTRY 61 - CREDIT AGENCIES OTHER THAN BANKS

I. Savings and Loan Associations	$586,178,000	$1,192,598,000	$4,221,000
II. Cooperative Farm Credit System			
A. Federal Land Bank Associations	11,662,797	14,481,380	---
B. Production Credit Association	6,018,287	7,769,263	---
III. Personal Credit Institutions			
A. Federal Credit Unions	87,826,759	180,004,506	116,388
B. State Credit Unions	108,062,044	201,515,044	5,344,076
C. Industrial Loan Companies	14,361,312	29,218,651	103,414
D. Licensed Small Loan Lenders	---	---	---
E. Installment Sales Finance Institutions	---	---	---
IV. Business Credit Institutions			
A. Bond and Mortgage Companies	---	---	---
B. Short-term Business Credit Institutions	---	---	---
V. Loan Correspondents and Brokers	---	---	---
Partial Output	$814,109,199	$1,625,586,844	$9,784,878

3. SIC 62 Security and Commodity Brokers, Dealers, Exchanges and Services

The output of this industry is defined by the OBE as total income "augmented to include net capital gain from sales of securities for their own account."[1] In this report, the output of SIC 62 is measured by business receipts, capital and noncapital gains, rents and royalties.

1. The 1958 Interindustry Relations Study, U.S. Department of Commerce, Office of Business Economics, National Economics Division, November 1964, SIC 60 (page 18 and 19).

Data following was published by the Internal Revenue Service in Business Tax Returns.

1963	Business Receipts	Capital and Noncapital Gains	Rents and Royalties
Sale Proprietorships	$ 377,758,000	----	----
Active Partnerships	1,204,727,000	$ 12,144,000	$11,596,000
Active Corporations	396,086,000	573,872,000	4,279,000
TOTAL	$1,978,571,000	$586,016,000	$15,875,000
1963 Output	$2,580,462,000		

Tax data for the year 1958 was not so detailed as the 1963 figures so that certain receipts had to be estimated. Specific amounts for the secondary receipts were not provided and only partial data concerning total receipts were given. Secondary receipts, therefore, were estimated by factoring 1963 business receipts to 1963 secondary receipts.

Capital and noncapital gains were estimated as the product of the ratio of 1963 business receipts to 1963 capital and noncapital gains, .2962, and the specified 1958 business receipts, $1,931,634,000. Capital and noncapital gains for 1958, therefore, was estimated as $572,149,991.

In like manner, rents and royalties were estimated for 1958 by applying the coefficient, .0080, (calculated as 1963 business receipts, $1,978,571,000 to 1963 rents and royalties, $15,875,000) to 1958 business receipts, $1,931,634,000. This product, $15,453,072, represents the estimated rent and royalty receipts for 1958.

The following amounts were totalled to measure 1958 output of this industry:

Business receipts	$1,931,634,000
Capital and noncapital gains	572,149,991
Rents and royalties	15,453,072
1958 OUTPUT	$2,519,237,063

Information supplied in County Business Patterns, 1964 indicated that the first quarter payroll figure for the Metropolitan State Economic Area (Providence, Bristol, and Kent counties) was $499,000 as compared to $223,555,000 nationally. Since it was impossible to

estimate the portion of output properly originating from the Massachusetts portion of the SMSA, the payroll figures for the Metropolitan State Economic Area were accepted as the basis of output estimation. This procedure seemed reasonable inasmuch as that portion of output which might be deemed applicable to the Massachusetts portion of the SMSA seemed to be quite small.

The payroll coefficient developed by comparing figures for the Metropolitan State Economic Area with the national data was .0022. This figure, when applied to the national output, provided an estimate of output in 1963 for the Providence SMSA, $5,677,016.

4. SIC 63 Insurance Carriers

The output of life insurance carriers is "measured by expenses,"[1] according to the OBE. As with mutual savings banks, these expenses involve an imputation of interest paid which is derived by deducting profits as well as dividends paid from total income. All insurance underwritten for foreign consumers is to be excluded and expenses of private pension funds are to be added to life insurance output.

For the purpose of this report, output of life insurance companies has been divided into two parts, the output resulting from the issuance of life insurance and annuities and the output resulting from the extension of accident and health insurance benefits to policyholders. Since the second portion, accident and health insurance, involves another concept of output, it will be discussed in the section dealing with nonlife insurance.

The portion of output of life insurance carriers from the extension of life insurance benefits is measured here as operating expenses incurred in the issuance of these benefits.

All data quoted, unless otherwise specified, were obtained from Chilton publications, The Spectator, Life Insurance Index, June 1964; Health Insurance Index, July 1965; Annual Statistical Issue, November

1. The 1958 Interindustry Relations Study, U. S. Department of Commerce, Office of Business Economics, National Economics Division, (November 1964), SIC 70 (page 18 and 19).

1964, November 1959.

The total incurred operating expenses of 801 life insurance companies doing business in 1963 was $5,958,550,140. These expenses included insurance taxes, licenses, etc., as well as $1,249,924,093 of operating expenses incurred in connection with the extension of accident and health insurance by 446 life insurance companies.

By deleting these accident and health insurance expenses, the 1963 output of legal reserve life insurance carriers involved in the production of life insurance was estimated as $4,708,626,047.

It was not possible to reduce this amount further by excluding coverage to foreign consumers (as called for in the OBE definitions), so the estimated output is overstated to that degree.

A national composite of 1958 operating expenses of life insurance companies was not readily available at this time. In order to complete the comparative national figures shown on the accompanying table, the 1958 output was roughly estimated by comparing the US totals of premiums received with the 1963 totals.

United States	1958	1963
Ordinary life premiums	$ 7,401,253,000	$ 9,941,211,000
Group life premiums	1,517,695,000	2,448,297,000
Industrial life premiums	1,390,211,000	1,327,281,000
TOTAL	$10,309,159,000	$13,716,789,000

Since the 1958 premiums so calculated were .7516 of the comparable 1963 amounts, output was considered to be proportionate to the same degree. The national 1958 output of life insurance carriers, therefore, was estimated as the product of .7516 and $4,708,626,047 or $3,539,003,337.

In order to allocate a portion of national output in 1963 to the Providence SMSA, the concept of output of life insurance carriers must be further defined. Although the effective issuance of life policies most often takes place legally in the various home offices of life companies, a major portion of the production of this coverage may be considered as having occurred in the field, in the case of

agency companies, or in home or branch offices, in the case of direct writing companies.

The output of Industry 64, insurance agents, etc., reflects indirectly the distribution of premiums on a geographical basis inasmuch as commissions are related to premiums incurred. Output of home and branch offices, however, can be distributed to particular local areas on the basis of payroll data.

According to first quarter 1964 payroll figures given in County Business Patterns, 1964 Department of Commerce, the ratio of SIC 631 (life carriers) payrolls nationally, $711,654,000, to Rhode Island, $2,616,000, was .0037. By applying the payroll ratio to the national output figure, estimated output for the State of Rhode Island was calculated as $17,421,916.

As mentioned previously in this report, the ratio of population of the Providence SMSA to the State of Rhode Island is .9553. The ratio of value added by manufacturers, adjusted, for the same areas was 1.1217.

Industrial and ordinary life and individual annuity output could more realistically be allocated to the SMSA on the basis of population while the group portion could more realistically be apportioned by means of the value-added ratio. In this case, the two approaches appear to balance sufficiently so that the state figure may be considered an appropriate estimate of output for the SMSA.

According to the Life Insurance Fact Book, 1964, published by the Institute of Life Insurance (page 107) legal reserve life insurance companies accounted for about 93% of all life insurance in force at the end of 1963. Total life insurance in force amounted to $785 billion, of which $730.6 billion was in force with legal reserve life insurance companies.

Of the remaining $55 billion of life insurance in force, veterans life insurance in force totalled $39.6 billion. This figure represents National Service Life Insurance, both participating and nonparticipating, and U. S. Government Life Insurance. Since federal government life insurance programs were not listed by the OBE in Sector 70, it would appear that no amount should be transferred to Sector 70 for

distribution to consumers. If this coverage has been included by the OBE in its 1958 I-O table, then output shown here will be understated to that degree.

To the national output estimates of life insurance carriers, amounts should be added which represent the output of state savings bank insurance plans (in New York, Connecticut, and Massachusetts), fraternal life insurance plans, and benefits provided by various assessment groups, including burial societies.

No specific information was available concerning total expenses of fraternals and assessment groups, but the Institute of Life Insurance in its 1959 and 1964 Fact Books did include the following data concerning assets of these groups as well as assets of U. S. Life Insurance Companies.

Assets	1958	1963
U. S. Life Insurance Companies	$107,580,000,000	$141,121,000,000
Fraternals	2,919,000,000	3,550,000,000
Assessment groups	85,000,000	95,000,000

Output of fraternals and assessment groups has been estimated on the assumption that the value of assets reflects the expenses of these groups in the same manner, or in the same proportion, as in life companies. One might expect such groups to have a lower amount of assets per dollar of insurance in force than life carriers, but, by the same token, one might expect lower expenses due to the lack of commissions payable, etc. In the absence of more accurate information upon which to base estimates of output, therefore, it has been assumed that assets are a reliable measure of comparison in this industry.

In 1963, assets of fraternals represent .0252 of the assets of legal reserve life companies; assets of assessment groups represent .0007. The product of these coefficients and legal reserve life insurance company output in 1963, $4,708,626,047, provides estimates of outputs for these groups.

Outputs for 1958 were estimated in the same manner. Assets of fraternals were calculated as .0271 of assets of life companies and assessment associations' assets as .0008 of life companies' assets.

Since the output of legal reserve life insurance companies associated with the extension of life insurance protection in 1958 was $3,539,003,337, the 1958 output of assessment and fraternal groups have been estimated as follows:

Estimated Output	1958	1963
Fraternals	$95,906,990	$118,657,376
Assessment Associations	2,831,203	3,296,038

A portion of the national output in 1963 for these groups has been allocated to the State of Rhode Island on the basis of the geographical distribution of premiums of legal reserve life companies. According to The Spectator, 1964 Annual Statistical Issue, November 1964, the total life premiums for US companies was $13,716,789,000. For Rhode Island the premium receipts were $74,158,000, or .0054 of the national total.

Estimating the output of fraternals in 1963, the product of .0054 and national output, $118,657,376 was calculated as $640,750. For Rhode Island assessment associations; output was estimated as the product of .0054 and $3,296,038, or $17,999.

To convert the figures for the State of Rhode Island to estimates for the Providence SMSA, the State outputs have been further reduced by multiplying these figures by the ratio of population of the SMSA to the State, .9553. Output of fraternals for the Providence SMSA was estimated to be $612,108; output of assessment groups for the Providence SMSA was estimated to be $17,003.

In addition to coverage by legal reserve life insurance companies, fraternal benefit societies and assessment associations, $1,635,266,000 of life insurance was in force in 1963 in savings bank life insurance.

In order to estimate output derived from this source, it has again been assumed that assets are in appropriate measure of output. Assets of savings bank life insurance by state were reported in Life Insurance Fact Book, 1964 (page 108) as follows:

Savings Bank Life Insurance

	1958	1963
Connecticut - Assets	$ 7,096,000	$ 11,802,000
Massachusetts* - Assets	146,928,000	191,235,000
New York - Assets	70,413,000	114,849,000
Total Assets	$224,437,000	$317,886,000

*As of 10-31.

As previously indicated, assets of legal reserve life insurance companies in the United States were $107,580,000,000 in 1958 and $141,121,000,000 in 1963. In 1958, therefore, the ratio of assets of savings bank life insurance to assets of life carriers was .0021; in 1963, the ratio was calculated as .0023.

Output was then estimated by applying these ratios to the output of legal reserve life insurance companies in the appropriate years. Insurance output of savings banks for 1958 was estimated to be the products of .0021 and $3,539,003,337, or $7,431,907. The product of .0023 and $4,708,626,047, or $10,829,840, represented the estimate of 1963 insurance output of savings banks.

A similar comparison of assets was made for savings bank life insurance in Massachusetts in order to estimate that portion of output which might be allocated to the Providence SMSA. The ratio of assets of Massachusetts' savings bank life insurance to the assets of United States life insurance companies in 1963 was calculated as .0014. Output for Massachusetts, therefore, was estimated by applying this ratio to the output of life insurance carriers, $4,708,626,047. The resulting estimate for Massachusetts was calculated to be $6,592,076.

According to 1960 census figures, 1.6 percent of the population of the State of Massachusetts was located within the Providence SMSA.

Since no issuing bank in the system was located in the SMSA, only the small output of commission banks could properly be included as output of the Providence SMSA. Because the commissions are small and more specific information was not available at this time, it has been assumed that approximately one-third of the population ratio, .005, would be an adequate proportion of state output to be allocated to the

Providence SMSA. The output of savings bank life insurance for the Providence SMSA, therefore, was estimated as the product of .005 and $6,592,076, or $32,960.

Data concerning uninsured private pension plans, including funds of nonprofit organizations and multi-employer plans as well as corporate pension plans, were reported by the United States Securities and Exchange Commission in Statistical Bulletin, June 1964.

Since the OBE has defined expenses as a measure of output for life insurance carriers, a similar measure of output has been used in the estimation of output of private pension plans. Total disbursements and expenses chargeable to the funds, other than benefit payments, amounted to $44,000,000 in 1963. This figure has been accepted as an estimate of 1963 output.

Statistics reported in the June 1959 SEC Statistical Bulletin included only data concerning corporate pension funds, the largest portion of total uninsured private pension plans. Expenses, exclusive of benefits paid, were reported to be $31,000,000.

In order to expand the expense figure for corporate pension plans to include funds of nonprofit organizations, etc., a comparison was made of the market values of the total assets of all uninsured private funds in 1958 and the market value of the total assets of corporate pension funds in 1958.

The 1964 Statistical Bulletin reported revised figures for the year 1958. The market value of total assets of all private uninsured pension plans was reported as $28,167,000,000. The market value of total assets of corporate pension plans was quoted as $23,234,000,000. Corporate pension fund assets represent 82.5 percent of total uninsured pension plan assets.

By assuming that expenses of corporate funds are, therefore, 82.5 percent of expenses of all uninsured plans' expenses, 1958 output for uninsured private pension plans has been estimated as $37,575,758.

Inasmuch as corporate plans represent such a large proportion of the total output, the output for the State of Rhode Island has been estimated on the basis of 1964 payroll distribution of all industries.

County Business Patterns reported the total national first quarter payroll for all industries as $57,601,221,000 and the total quarterly payroll in Rhode Island for all industries as $265,235,000. A ratio comparing the payroll figures was developed, .0046, and applied to the 1963 total national output, $44,000,000, to obtain an estimate of output for the State of Rhode Island as $202,400.

This figure was further expanded by the ratio of value added by manufacture of the SMSA to the state, 1.1217, because of the largely corporate source of these plans. Output for the Providence SMSA was estimated, therefore, to be $227,032.

"Nonlife insurance output is measured on a net basis, that is, premiums earned less benefits paid."[1] Net premiums incurred for accident and health insurance for foreign consumers should also be excluded from the output of this industry.

Data shown in The Spectator, Property, Liability Index, May 1964, for all 1177 fire, casualty and multiple life insurance companies, include amounts for accident and health insurance issued by property liability companies and exclude the accident and health business written by life companies. All data include coverage of foreign consumers and are, therefore, somewhat overstated.

The output figures used here are net premiums written less losses incurred. Net premiums written are direct premiums plus reinsurance assumed less reinsurance ceded. Incurred losses include adjustment expenses, such as loss investigation.

1963 - Property Liability Companies - All Benefits	
Net premiums Written	$16,374,619,122
Less: Losses Incurred	10,761,613,704
OUTPUT	$ 5,613,005,418

To this output an additional amount must be added which represents premiums and losses from the accident and health business of the 446

1. The 1958 Interindustry Relations Study, U. S. Department of Commerce, Office of Business Economics, National Economics Division, (November 1964) SIC 70 (page 18 and 19).

life insurance companies providing these benefits. Output was estimated from data in The Spectator, Health Insurance Index, July 1965.

1963 - Life Companies - Accident and Health Benefits

Premiums Written, less dividends to policyholders or earned income credit	$5,328,077,996
Dividends	62,300,948
	$5,390,378,944
Less: Losses	4,012,760,932
OUTPUT	$1,377,618,012

In addition, output must be added for Blue Cross Hospital Plans (members of the American Hospital Association) and Blue Shield Plans.

Aggregates were listed for 1963 in the 1964 Health Insurance Index.

	Blue Cross Plans	Blue Shield Plans	Total
Earned Subscription Income	$2,506,405,053	$1,199,046,364	$3,705,451,417
Claims Expense	2,379,155,092	1,082,815,110	3,461,970,202
OUTPUT	$ 127,249,961	$ 116,231,254	$ 243,481,215

As with life company figures, no aggregate totals of premium and losses of property liability companies were readily available for the year 1958. These figures were estimated, therefore, on the basis of data available in The Spectator, Annual Statistical Issue, November 1958 and November 1964. Property Insurance Premium for each state was totalled for the nation as a whole in 1958 as $17,521,063,000; in 1963, $24,775,630,000. The product of the ratio of these totals, .7072, and the 1963 property liability companies' output, $5,613,005,418, has been used as an estimation of 1958 output. This output of property liability companies in 1958, therefore, was estimated as $3,969,517,432.

State premiums for health lines were totaled for 1953 and 1963 for the United States as follows:

Earned Premiums	1958	1963
Accident only (individual)	$ 165,744,000	$ 195,217,000
Accident and Health (individual)	461,741,000	561,990,000
Hospital, Medical, Expense (individual)	2,603,903,000	4,281,023,000
Group Accident and Health	2,357,433,000	4,068,751,000
TOTAL	$5,588,821,000	$9,106,981,000

The ratio of 1958 earned premiums to 1963 earned premiums for accident and health coverage was calculated as .6137. The 1958 estimate of output of life companies in connection with the extension of accident and health benefits to policyholders is assumed to be the product of .6137 and $1,377,618,012, or $845,444,174.

Similarly, the 1958 output of Blue Cross and Blue Shield Plans is estimated to be the product of .6137 and $243,481,215 or $149,424,422.

The factory mutuals, seven mutual fire insurance companies of which Blackstone Mutual Insurance Company and Firemen's Mutual Insurance Company, both of Providence, Rhode Island, are examples, use a premium deposit method of charging for insurance. Since the premium method employed by these companies differs from that used by the 1177 property liability companies mentioned above, they have been treated separately. The Property, Liability Index, 1963 and 1964, are the sources of statistics upon which the following estimates of output are made.

The factory mutual insurance companies charge a deposit from which they deduct losses and net additions to reserves after income from investments has been credited. The balance is returned to policyholders or used as renewal deposits. In 1963 some 80 percent to 90 percent of unabsored premiums were returned. Output for this group, therefore, will be considered as underwriting and adjusting expenses incurred.

National output for all seven companies amounted to $22,780,356 in 1963 and $19,585,535 in 1958. The two Providence companies had expenses of $2,632,572 and $5,452,043, for a total of $8,084,615, representing output for the Providence SMSA.

As life insurance companies' output was allocated to the State of Rhode Island, output of nonlife carriers was also distributed by means

of data provided in County Business Patterns, 1964. The first quarter 1964 payroll figures for SIC 63, excluding SIC 631 (Life carriers) for Rhode Island and for the United States were $3,532,000 and $521,796,000, respectively. The ratio of state payrolls to national payrolls was calculated as .0068.

Output of property liability companies for Rhode Island was estimated as the product of .0068 and $5,613,005,418, or $38,168,437.

Output of Blue Cross and Blue Shield Plans in Rhode Island was estimated as the product of .0068 and 243,481,215, or $1,655,672.

Output of life companies in connection with accident and health insurance was estimated for Rhode Island by applying the life insurance carrier payroll coefficient, .0037, to the national output pertaining to accident and health benefits extended by life companies, $1,377,618,012. Rhode Island output, therefore, was estimated as $5,097,187.

In The Spectator, Annual Statistical Issue, November 1964, the population of Rhode Island was reported to be .4 of the national population and property premiums to be .4 of national figures. It has been assumed, therefore, that population figures are an adequate measure of distribution of output to the Providence SMSA for the non-life insurance portion of this industry.

Inasmuch as the ratio of 1960 population of the SMSA to the State has been calculated as .9553, all estimated State outputs, with exception of factory mutuals, were reduced by this coefficient.

The following amounts represent estimates of output for the Providence SMSA in 1963:

Life Companies - Accident and Health	$ 4,869,343
Property Liability Companies	36,462,308
Blue Cross and Blue Shield Plans	1,581,663

Secondary receipts of Sector 70 which are specifically included by the OBE are rents and royalties.[2] Rents and royalty receipts of corporate insurance carriers were reported in U.S. Business Tax

2. Op. cit., (Pages 18 and 19).

Returns, 1963, as $494,655,000.

Although not specified in 1958 tax data, rents and royalties for 1958 were estimated on the basis of the ratio of receipts in excess of business receipts and rent and royalty receipts for insurance carriers in 1963. This ratio, 8,206,032,000 to 494,655,000, or .0603, was then applied to the 1958 receipts in excess of business receipts, $5,324,475,000. The product, 321,065,842, represents an estimate of rents and royalties for 1958.

These secondary receipts were allocated to the State of Rhode Island by applying a payroll coefficient for all business in SIC 63. The product of the national output, $494,655,000, and the coefficient, .0050, represents the allocation of rents and royalties to the State of Rhode Island. By further reducing this amount, $2,473,275, by the population coefficient, .9553, rents and royalties were estimated for the Providence SMSA as $2,362,720.

		INDUSTRY 63 - Insurance Carriers		
OUTPUT		U.S. - 1958	U.S. - 1963	Providence SMSA - 1963
I.	Life Ins. Cos. - Life Ins. and Annuity Benefits	$3,539,003,337	$ 4,708,626,047	$17,421,916
II.	Fraternal Organizations	95,906,990	118,657,376	612,108
III.	Assessment Assns.	2,831,203	3,296,038	17,003
IV.	Savings Bank Life Insurance	7,431,907	10,829,840	32,960
V.	Private Pension Plans	37,575,758	44,000,000	227,032
VI.	Property Liability Cos. - All Benefits	3,969,517,432	5,613,005,418	36,462,308
VII.	Life Ins. Cos. - Accident & Health Insurance	845,444,174	1,377,618,012	4,969,343
VIII.	Blue Cross & Blue Shield Plans	149,424,422	243,481,215	1,581,663
IX.	Factory Mutual Ins. Companies	19,585,535	22,780,356	8,084,615
X.	Rents & Royalties	321,065,842	494,655,000	2,362,720
	TOTAL	$8,987,786,600	$12,636,949,302	$71,671,668

5. SIC 64 Insurance Agents, Bokers, and Service

Output of this industry has been defined by the OBE as "total income." Unless specifically included, capital and noncapital gains have not been included in national output figures. The measure of output of this industry, therefore, in this report will be business receipts plus the secondary receipts of rents and royalties.

The following national data used in establishing the income of SIC 64 was taken from U.S. Business Tax Returns, Statistics of Income, 1958 and 1963, U.S. Treasury Department, Internal Revenue Service.

Since the 1958 statistics did not include a breakdown of receipts other than business receipts, an estimate of rents and royalty receipts was calculated based upon the ratio of business receipts to rents and royalties in 1963. This ratio, .0022, was then applied to the 1958 business receipt figure, $3,353,728,000, to estimate the 1958 secondary receipts, $7,378,202.

U.S. 1958

	Business Receipts	Estimated Rents and Royalties	Total
Sole Proprietorships	$1,620,368,000		
Active Partnerships	655,549,000		
Active Corporations	1,007,816,000		
OUTPUT	3,353,728,000	$7,378,202	$3,361,106,202

U.S. 1963

	Business Receipts	Rents and Royalties	Total
Sole Proprietorships	$1,878,305,000		$1,878,305,000
Active Partnerships	637,851,000	$ 1,575,000[a]	639,426,000
Active Corporations	2,196,823,000	8,820,000	2,205,643,000
OUTPUT	$4,712,979,000	$10,395,000	$4,723,374,000

a. Estimate of royalties not included because of high sampling variability.

According to statistics in County Business Patterns, 1964, Department of Commerce, Bureau of the Census, the first quarter payroll totals of insurance agents, for the nation as a whole was $288,989,000 and for Rhode Island, $1,687,000. Presumably there is a direct connection between business receipts and payroll in this service industry. It has been assumed, therefore, that an estimate of output for the State of Rhode Island can be calculated by applying the payroll coefficient, .0058, to the national 1963 output, $4,723,374,000. The resulting estimate of state output, therefore, would be $27,395,569.

The Census of Population indicated that the number of people employed in this industry in Rhode Island in 1960 was 5026. In the Providence SMSA 5031 persons were so employed. Since the number employed is virtually identical in the two areas, the estimate of state output has been accepted as the output of the SMSA.

6. SIC 66 Combinations of Real Estate, Insurance, Loan and Law Offices

As with SIC 62, security and commodity brokers, etc., output of this industry has been construed as business receipts plus the following secondary receipts: capital and noncapital gains, rents and royalties.

Because a portion of this industry deals in the sale of real property, capital and noncapital gains have been included in the estimation of income, or output, for SIC 66 (see Sector 71 - Real Estate).

The national 1963 output of this industry was estimated from data published in U.S. Business Tax Returns under the heading "Real Estate." Although the Internal Revenue Department included the output of SIC 66 with businesses in Sector 71, the following amounts should properly be included in Sector 70.

The secondary receipts were not specified in income tax data and have been estimated on the basis of figures given for total "Real Estate." The ratio of capital and noncapital gains, $1,537,287,000, to receipts other than business receipts, $3,244,350,000, was calculated for all amounts shown as "Real Estate" by the Internal Revenue

U.S. 1963	Business Receipts	Estimated Capital and Non-capital Gains	Estimated Rents and Royalties
Sole Proprietorships	$428,339,000		
Active Partnerships	97,163,000		
Active Corporations	266,597,000		
	$792,099,000	$36,537,087	$14,065,776
Total Estimated Output	$842,701,873		

Service in 1963. This ratio, .4738, was then applied to receipts other than business receipts, $77,115,000, of combination offices, SIC 66. The estimated capital and noncapital gains for this industry, therefore, was $36,537,087 in 1963.

In this manner, the ratio of rents and royalties, $591,689,000, to receipts other than business receipts, $3,244,350,000, for all amounts shown as "Real Estate" was calculated as .1824. The product of .1824 and $77,115,000; $14,065,776, represented the estimate of rents and royalties for SIC 66.

Total national output for 1963 was estimated as $842,701,873.

The data supplied by the Internal Revenue Service for 1958 did not include any breakdown of revenue under the heading "Real Estate" so no realistic estimate of SIC 66 output could be calculated. For comparison purposes, however, we have assumed that the ratio of SIC 66 output to business receipts (reporting of total receipts was also incomplete in 1958) of all real estate firms shown in tax data was stable over the years.

In 1963 business receipts under the heading "Real Estate" was $14,930,328,000. Output of SIC 66 was estimated as $842,701,873. The ratio of these figures, .0564, when applied to business receipts under the tax heading "Real Estate" for 1958, $8,507,529,000, provided an estimate of SIC 66 output for 1958, $479,824,636.

In order to allocate the portion of national output in 1963 that pertains to the Providence SMSA, a comparison was made of payroll figures of SIC 66 for the nation as a whole and for the State of Rhode Island. First quarter payroll figures for this industry reported in

County Business Patterns, 1964, were 37,721,000 on a national basis and 263,000 for the State of Rhode Island. A payroll coefficient was developed of .0070. The output for Rhode Island was estimated as the product of .0070 and the national output, $842,701,873, or $5,898,913.

As previously noted, the ratio of population in the Providence SMSA to population in the State of Rhode Island was .9553. As with real estate firms, 1960 population has been considered an adequate measure of geographical distribution for this industry. The Rhode Island output, therefore, was reduced to reflect the population ratio. The resulting estimate of output of SIC 66 in the Providence SMSA was $5,635,232.

7. Holding and Other Investment Companies

As with SIC 64, the OBE definition of output for this industry is "total income."[1] The measurement of output in this report, therefore, is business receipts plus rents and royalties.

The following statistics were given by the Internal Revenue Service in U.S. Business Tax Returns, 1963. Data concerning sole prioprietorships and active partnerships with and without net profit were found under the heading "all banks and trust companies, insurance, holding and investment companies." Because all business receipts of insurance companies and banks are here considered corporate receipts, all business receipts shown under this heading are considered portions of output of SIC Rents and royalty receipts were specified for active corporations only.

1963	Business Receipts	Rents and Royalties	Total
Sole proprietorships	$ 10,455,000	----	$ 10,455,000
Active partnerships	138,830,000	----	138,830,000
Active corporations	281,561,000	$173,922,000	455,483,000
OUTPUT	$430,846,000	$173,922,000	$604,768,000

In 1958 tax data only total and business receipts were listed for corporations, $1,805,822,000 and $79,962,000, respectively. Since

1. op. cit. (Pages 18 and 19).

amounts were not specified for proprietorships and partnerships, the estimated 1958 output is somewhat understated.

Corporate rents and royalties for 1958 were estimated on the basis of the ratio of 1963 corporate rents and royalties, $173,922,000, to 1963 corporate receipts other than business receipts, $2,752,197,000. This ratio, .0632, when applied to 1958 corporate receipts other than business receipts, $1,725,840,000, resulted in an estimate of 1958 rent and royalty receipts, $109,073,088. Estimated output for 1958, therefore, totalled $189,055,088.

National output in 1963 was apportioned to the State of Rhode Island on the basis of 1964 payroll data in County Business Patterns. SIC 67 first quarter payroll amounts were $53,443,000 on a national level and $131,000 on a state level. The payroll coefficient, .0024, when applied to national output resulted in an estimated output for the State of Rhode Island, $1,511,920.

Payroll data in County Business Patterns also revealed that all employers of SIC 67 were located in Providence County. It seems realistic, therefore, to assume that the origin of all Rhode Island output of this industry was located in the City of Providence and that output for the state would equal that of the Providence SMSA.

8. Comparison of National Data

According to the Office of Business Economics in its 1958 Input-Output table as published in the Survey of Current Business, September 1965, the total output for Sector 70 without transfers was $26,401,000,000. The total output estimated in this report for 1958 was $23,944,988,391, or 90.70 percent of the OBE figures.

This approximate ten percent difference may have been the result of several factors. Many assumptions were made throughout this report which may not have agreed exactly with those made by the OBE. The tax data for 1958 was not so detailed as the 1963 data so that estimates of secondary receipts for 1958 were based upon 1963 ratios of secondary receipts to business receipts.

The interpretation of the definition of output of SIC 62, 64, 66, and 67 is of primary importance and may explain the discrepancy of

this Sector's output. The measurement of "total income" may not be the same in this report as that used by the OBE. If by "total income," it is meant total receipts then the output shown here is understated. Except for SIC 62 and 66 which specifically included capital and non-capital gains by definition, investment income has been omitted from this report.

As stated previously, the output of licensed small loan lenders and installment sales finance institutions as well as business credit institutions was omitted from the output of SIC 61. The output of this industry, therefore, is understated to this extent.

The following statistics indicate output for the various industries within Sector 70 as estimated in this report. It has been assumed that, since the 1958 national total is 90.70 percent of the OBE total, the 1963 figures shown here are also 90.70 percent of the output for 1963. Expansion figures have been included to complete the estimate of output for Sector 70.

Sector 70	U.S. - 1958	U.S. - 1963	Providence SMSA - 1963
I. SIC 60 - Banking	$ 7,593,869,603	$10,536,797,952	$ 46,926,377
II. SIC 61 - Credit Agencies	814,109,199	1,625,586,844	9,784,878
III. SIC 62 - Security and Commodity Brokers	2,519,237,063	2,580,462,000	5,677,016
IV. SIC 63 - Insurance Carriers	8,987,786,600	12,636,949,302	71,671,668
V. SIC 64 - Insurance Agents	3,361,106,202	4,723,374,000	27,395,569
VI. SIC 66 - Combination Offices	479,824,636	842,701,873	5,635,232
VII. SIC 67 - Holding Companies	189,055,088	604,768,000	1,511,920
TOTAL	$23,944,988,391	$33,550,639,971	$168,602,660
Expansion Figure	2,456,011,609	3,440,142,797	17,287,814
OUTPUT	$26,401,000,000	$36,990,782,768	$185,890,474

G. REAL ESTATE AND RENTAL

I-O 71 Real Estate and Rental

SIC 65

651 Real estate operators (except developers and lessors)
- 6512 Operators of nonresidential buildings
- 6513 Operators of apartment buildings
- 6514 Operators of dwellings other than apartment buildings
- 6515 Lessors of agricultural, forest and similar properties
- 6516 Lessors of mining, oil and similar properties
- 6517 Lessors of railroad property
- 6518 Lessors of public utility property
- 6519 Lessors of real property, n.e.c.

653 Agents, Brokers, and Managers

655 Subdividers and Developers

For the most part this sector deals with the actual rental payments of business and government, rental payments on tenant occupied dwelling and the imputed rental value of owner occupied dwellings. Royalties paid to individuals and businesses are also included as are sales commissions paid to real estate firms and construction firms.

1. Rents and Royalties Received by Individuals and Government

Figures published by the U. S. Department of Commerce, Office of Business Economics, "Personal Consumption Expenditures by Type of Product," Survey of Current Business, November 1965, revealed the imputed rental value of owner occupied non-farm dwellings in 1963 as $37,109,000,000.

From data available in the 1960 Census of Housing, U. S. Bureau of the Census, the total value of these dwellings was estimated on a

national basis as the product of the national median value per owner-occupied dwelling, $11,900, and the reported number of such units, 26,171,774. The total value of these dwellings, therefore, was estimated to be $311,444,110,600.

By calculating the ratio of imputed rental value to the total value of these dwellings, an average rent per dollar of dwelling value was estimated as $.119.

In like manner, dwelling values for owner-occupied dwellings in the Providence SMSA was defined as the product of the SMSA median value per dwelling, $12,200, and the number of units, 107,375, or $1,309,975,000. The imputed value of owner-occupied dwellings in the Providence SMSA was estimated as $155,887,025, by applying the average rent per dollar of dwelling value to SMSA total dwelling values.

It must be noted that the estimate of imputed rental value of owner-occupied dwellings in the Providence SMSA may be inflated somewhat by the use of medians rather than arithmetic averages in census statistics. As with all census statistics, sampling variability is inherent in the figures used. In addition, by applying an average national rent per dollar of dwelling value, calculated on the basis of a lower median national value per unit, to an amount based upon a higher median local value per unit, inflation of the product must be recognized.

This inflation of imputed rental value of owner-occupied dwellings is partially, if not completely, offset by the inclusion of the rental value of farm dwellings separately at the national level.[1] Inasmuch as the 1960 Census of Housing did not differentiate between

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1. The 1958 Interindustry Relations Study, U. S. Department of Commerce, Office of Business Economics, National Economics Division, November 1964 (page 20). -- The farm operator dwelling rent is treated by the OBE as part of gross farm income and not part of the primary output of this industry. As a secondary receipt of this industry, however, farm operator dwelling rent is included in Industry 71.

Rents and royalties of other businesses, secondary receipts of other industries, are discussed later in this report.

rural and urban dwellings and the number of all units was used in calculating the imputed rental value in the Providence SMSA, the estimate so calculated must be considered to include owner-occupied farm dwellings as well as non-farm dwellings in the Providence SMSA.

The national statistics for the rental value of tenant occupied non-farm dwellings and the rental value of farm dwellings, owner and non-owner occupied, were listed in the Survey of Current Business, November 1965, as $14,568,000,000 and $2,120,000,000 respectively.

Amounts of rent receipts of individuals both on a national basis and on a local basis for the Providence SMSA were estimated from figures published by the Internal Revenue Service in Statistics of Income 1963, Individual Tax Returns.

"Rent net income and loss," net rent receipts, were reported as $2,717,295,000 for a total of all individual states' net receipts and $7,088,000 for the Providence SMSA.

The ratio of national rental value of tenant-occupied non-farm dwellings to the total of all individual states'[2] net rent receipts was calculated as 5.361. This ratio was then applied to the net rent receipts data for the Providence SMSA to estimate total rental value of tenant-occupied dwellings in this area, $37,998,768.

Rents of various non-profit institutions should also be included in Industry 71. National statistics in the Survey of Current Business, November 1965, provided no separate breakdown of "other rental values." This amount, $1,712,000,000, was the total of rental values of all transient hotels, motels, clubs, schools and institutions, most of which properly belongs in Industry 72. No estimate for institutional rental values was made in this report.

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2. Statistics of Income 1963, Individual Tax Returns, Internal Revenue Service, U. S. Treasury Department (pages 11 and 15). -- The "total of states" figure was used for comparison because the weighting factors for state and metropolitan area data are different from those for national data.

Royalty receipts of individuals, $643,938,000, were obtained on a national basis from Statistics of Income 1963, Individual Tax Returns. No breakdown was given for royalty receipts, however, for SMSA areas. The statistics shown for individual states did not indicate an amount for the State of Rhode Island due to high sampling variability. In the absence of any information upon which to base an estimate, this amount was also omitted from the accompanying table for the Providence SMSA.

Completing the output of this sector received by individuals and government, data was compiled from statistics of the Internal Revenue Service, Statistics of Income 1963, Business Tax Returns.

Business rental payments were totaled as follows:

All Industries	Rental Payments
Sole proprietorships	$ 3,866,323,000
Active partnerships	1,409,453,000
Active corporations	12,036,821,000
TOTAL	$17,312,597,000

Business receipts for rents and royalties were then totaled and subtracted from the total rents paid by all businesses.

All Industries	Rent Receipts	Royalty Receipts
Active partnerships	$ 262,681,000	$ 52,906,000
Active corporations	4,276,659,000	1,151,066,000
TOTAL	$4,539,340,000	$1,203,972,000

Net business property rental payments, therefore, equaled $11,569,285,000 on a national basis.

In the absence of specific information concerning business rental payments and business rental and royalty receipts in the Providence SMSA, a method of estimating these amounts was used which took into account first quarter payroll figures as reported in County Business Patterns 1964, U. S. Department of Commerce.[3]

3. The use of payroll figures in estimating receipts and payments at the local level assumes that there is a significant relationship between the output of this industry and the price of labor, at least so far as geographical distribution is concerned.

A ratio of national payrolls to State of Rhode Island payrolls was calculated and applied to both national payments and receipt statistics in order to estimate figures for the State of Rhode Island.

State figures had then to be converted to amounts pertaining to the SMSA. A ratio of population of the Providence SMSA to the population of the State of Rhode Island was established as .9553. This coefficient was applied to estimated state payments and revenues to further estimate the business payments and receipts in the Providence SMSA.

All industries' business rental payments as estimated for the Providence SMSA would be represented by the following product: $17,312,597,000 x .0046 x .9553 = $76,078,130.

Similarly all industries' business rental receipts and royalty receipts as estimated for the Providence SMSA would be the following product: $5,743,312,000 x .0046 x .9553 = $25,238,295.

The difference of these products, $50,839,835, is the amount estimated to be the net business rental payments to individuals and government in the Providence SMSA.

2. Rents and Royalties Received by Businesses

National rent and royalty receipts of SIC 15, 16, and 17 establishments (construction firms) were reported in U. S. Business Tax Returns as follows:

Construction Firms	Rent Receipts	Royalty Receipts	Total
Active partnerships	$ 25,184,000	$ 472,000	$ 25,656,000
Active corporations	216,918,000	5,253,000	222,171,000
TOTAL	$242,102,000	$5,725,000	$247,827,000

No breakdown was given for receipts of sole proprietorships in the contract construction industry so this amount was omitted from national and local totals.

By using the method of estimating total business rent receipts mentioned above, the rent receipts and royalties of SIC 15, 16, and 17 were calculated for the Providence SMSA as follows. The contract

construction rent and royalty receipts, $247,827,000, was multiplied by the coefficient of Rhode Island contract construction payroll to U.S. contract construction payroll, .0041, to estimate the state rent and royalty receipts of this industry. This product, $1,016,091, was further reduced by the population coefficient, .9553, to estimate the amount of rent and royalty receipts to be assigned to the Providence SMSA, $970,672.

According to the OBE definition,[4] "since trading in real property is the main function of real estate developers, their net gains from sales of real property are included in the output and profit measures for this industry, although, in general, capital gains are excluded from the national account measures."

The measurement of output of real estate firms, therefore, has been estimated in this report as business receipts plus the secondary receipts of net capital and noncapital gains in addition to rent and royalty receipts.

The following national statistics were reported under the heading "Real Estate" in U. S. Business Tax Returns, 1963:

"Real Estate"	Business Receipts	Capital and Noncapital Gains	Rents and Royalties
Sole proprietorships	$3,112,212,000	---	---
Active partnerships	3,385,982,000	$ 25,395,000	$ 30,466,000
Active corporations	8,432,134,000	1,511,892,000	561,223,000
	$14,930,328,000	$1,537,287,000	$591,689,000
TOTAL	$17,059,304,000		

As stated in the previous section, the Internal Revenue Service included in the above figures amounts which represented output of SIC 66 and, as such, should properly have been included in Sector 70.

The corrected estimates of output for SIC 65, except 6541 and part of 6561, should indicate the deletion of receipts for SIC 66, $842,701,873. The corrected output of these businesses, therefore, is $16,216,602,127.

4. The 1958 Interindustry Relations Study (page 20).

Total combined receipts of real estate firms in the Providence SMSA was estimated as the product of the total US receipts, $16,216,602,127, the real estate payroll coefficient, .0040, and the population coefficient, .9553. The resulting estimate was $61,966,881.

3. Comparison of National and Providence SMSA Data

Although the OBE included transfers of secondary receipts of industries other than SIC 15, 16, and 17 (Construction) and SIC 65 (Real Estate) in the output of Sector 71 for distribution to consuming industries, rents and royalties of all other industries, including SIC 66, $4,917,861,776, have not been included in the figures on the accompanying table.

As explained previously, no estimates were made for rents of non-profit institutions on either a national or a local level and no estimate was made for individual royalties in the Providence SMSA.

With the above omissions, total output in the United States for Industry 71 was $82,474,652,127 and in the Providence SMSA, $307,663,181.

I-O 71 Real Estate and Rental

		U.S. 1963	1963 Providence SMSA
I.	Rents and Royalties Received by Individuals and Government		
	A. Imputed Rental Value of Owner-Occupied Non-Farm Dwellings	$37,109,000,000	$155,887,025
	B. Rental Value - Farm Dwellings	2,120,000,000	See Below[a]
	C. Rental Value of Tenant Occupied Non-Farm Dwellings	14,568,000,000	37,998,768
	D. Royalty Receipts - Individuals	643,938,000	---
	E. Net Rental Payments of Business	11,569,285,000	50,839,835
II.	Rents and Royalties Received by Businesses		
	A. Rent and Royalty Receipts of SIC 15, 16, and 17 (Construction)	247,827,000	970,672
	B. Output of SIC 65 Except 654 (Real Estate)	16,216,602,127	61,966,881
	TOTAL	$82,474,652,127	$307,663,181

a. Rental values on farm dwellings included in A and C for the Providence SMSA. See text.

H. SERVICES

I-O Sectors 72 through 77

Some resources for developing estimates for the service industries in a SMSA which can be used for most of the larger SMSA's are not available in making such estimates for the Providence SMSA. The unavailability of information goes beyond the usual problem associated with the fact that the SMSA is in two states and cannot be defined in terms of counties.

The 1963 Statistics of Income, U.S. Business Tax Returns provides data on receipts for both sole proprietorships and partnerships for 16 sub-sections of the service industries for a majority of the states and, for a number of the larger states, by Internal Revenue Service districts. For Rhode Island no data is given for sole proprietorships and only an abbreviated form of the information for partnerships is published. The only relevant 1963 figure for Rhode Island in this source is for "total receipts" of partnerships classified in the service industries. For 1962 more data is available: both business receipts and total receipts are given for partnerships and business receipts for sole proprietorships; in both cases figures are given only for all service enterprises combined. The estimate given below of receipts of all service enterprises in Rhode Island, both incorporated and unincorporated, developed from this data can, at best, be regarded only as rough, because of sampling variability.

For 1962 total receipts of partnerships in service industries in Rhode Island was shown as $32,196,000; business receipts of proprietorships was shown as $128,929,000. Both results are based on samples and tables given showing sampling variability indicate that about 35 percent-40 percent variation in the partnership figures and about

20 percent variation in the sole proprietorship figures would be estimated at the 95 percent confidence level. For 1963 total receipts of partnerships in service industries in the state is shown as $40,759,000. If we assume that the same ratio between partnership and sole proprietorship receipts prevailed in 1963 as prevailed in 1962, sole proprietorship business receipts may be estimated at $163,?20. The sampling variability for the partnership figure for 1963 must also be estimated at close to 40 percent at the 95 percent confidence level so the confidence in the estimate of receipts of sole proprietorships for 1963 must be extremely low. If, in spite of the low degree of confidence that can be placed in this figure it is combined with the published figure for receipts by partnerships and the total non-corporate receipts are used to estimate total receipts for service industries in Rhode Island on the basis of the ratio of non-corporate to total service industry receipts reported in Business Tax Returns for the entire US in 1963, we get an overall estimate of $364,261,000 for service industry receipts in Rhode Island in 1963. The amounts and the ratios seem reasonable and the figure may be regarded as probably useful as a check on other data. The absence of any breakdown between service industries in the data for Rhode Island would not permit much further use of this data even if greater confidence could be placed in the estimate.

The only reasonably complete coverage of these sectors which separates them from each other and from other sectors and is available for the Providence SMSA (or the State of Rhode Island) seems to be the information on industry of the employed for 1959 published in the 1960 Population Census. Using number of persons employed in the industry and median incomes, estimates of relative personal income by industry were developed. These estimates were then used to allocate between I-O sectors or parts of sectors an independently obtained estimate of the output of the group of service sectors. For some parts of sectors data from the 1963 Census of Business is available. This source was used whenever possible but must be fitted into the overall material for the service sectors developed from the Population Census.

Fortunately the coverage of I-O sectors 72 through 77 plus I-O sector 86 (Households) is coterminal with the Population Census coverage for the four service industry groups (Business and Repair Services, Personal Services, Entertainment and Recreation Services, and Professional and Related Services) except for Educational Services, Government and two small four-digit industries Dressmaking Shops and Trading Stamp Services which are in I-O sectors 18 and 69 respectively. The 13 breakdowns of employment into industries in the relevant Population Census data fit the I-O sectoring reasonably well and allow the separation out of Educational Services, Government and Private Households. Employment data, but not income data, is available in the same source for Dressmaking Shops. The relation of I-O sectors, SIC Industries and Industry of the Employed is shown in Chart 72-77-1.

Output of the six service sectors in the I-O table was estimated for 1963 for the Providence SMSA by indexing from 1958 output estimates for each Population Census industry. A relative income earned figure for each Population Census industry was obtained by multiplying the males employed by their median income, the females employed by their median income and summing. Then 1958 output estimates for the Providence SMSA were developed by applying the ratio of relative incomes earned in Providence to those earned in the United States sector by sector to the outputs shown in the 1958 OBE table. Within each I-O sector product was assumed to be in proportion to relative income earned. These estimates are developed in Table 72-77-1. I-O sectors 73 and 74 are combined since the Population Census category Legal, Engineering, and Miscellaneous Professional Services covers the Research and Development Laboratory employees.

The indexing from 1958 to 1963 output was made as follows: County Business Patterns 1959 and 1964 provided data on First Quarter 1959 and First Quarter 1964 FICA payroll in these Population Census industries. The increase in such payrolls was 51.0 percent for the United States as a whole and 51.7 percent for Rhode Island. Increases for each of the eleven Population Census industries are shown in Table 72-77-2. Part of this increase was due to increased FICA

Chart 72-77-1

I-O Sector	SIC	Industry of the Employed	Detailed Industry of the Employed
72	70	Hotels & Lodging Places	Hotels & Lodging Places
	72	Laundering, Cleaning & Dyeing Services	Laundering, Cleaning, & Services
		All Other Personal Services (except Dressmaking Shops)	Shoe Repair Shops Barber & Beauty Shops Miscellaneous Personal Services Dressmaking Shops
	76 (exc. 769)	Miscellaneous Repair Service (part)	Miscellaneous Repair Service (part)
73	769	Miscellaneous Repair Service (part)	Miscellaneous Repair (part)
	73 (exc 7361,7391, 7399 pt)	Business Services (part)	Advertising Miscellaneous Business Services (part) exclude SIC 7361 Private Employment Agencies, & SIC 7399 pt. Trading Stamp Services
	81	Legal, Eng. Misc. Professional Services (part)	Legal Services
	89 (exc 8921)		Engineering & Architectural Services Accounting, Auditing & Bookkeeping Services Miscellaneous Professional & & Related Services (part)
74	7391	Legal, Eng., Misc. Professional Services (part)	Miscellaneous Professional Related Services (part)
75	75	Automobile Repair Services & Garages	Automobile Repair Services & Garages
76	78	Entertainment & Recreation Services	Theaters & Motion Pictures

Chart 72-77-1 (continued)

I-O Sector	SIC	Industry of the Employed	Detailed Industry of the Employed
	79		Bowling Alley, & Billiard & Pool Parlors Miscellaneous Entertainment & Recreation Services
77	80	Medical & Other Health Services	Medical & Other Health Services, exc. Hospitals Hospitals
	82 84	Educational Services, Government	Educational Services, Government
	8921	Educational Services, Private	Educational Services, Private
	86	Welfare, Religious, & Membership Organizations	Welfare & Religious Services Non Profit Membership Organizations
	7361	Business Services (part)	Miscellaneous Business Services (part) (Private Employment Agencies)
	0722	Legal, Eng., & Misc. Professional Services (part)	Miscellaneous Professional Related Services (part) (Veterinarians)
86	88	Private Households	Private Households

Table 72 - 77 - 1

RELATION OF I-O SECTORS, SIC INDUSTRIES, AND INDUSTRY OF THE EMPLOYED

I-O Sector	Industry of the Employed	# Employed	Median Income	# Employed	Median Income	Relative Income ($000,000)	# Employed	Median Income	# Employed	Median Income	Relative Income ($000)	1958 OBE Product US - Transfers ($000,000)	1958 Estimated Product R.I. ($000)
72	Hotels and Lodging Places	282,806	2,738	291,090	1,422	1,188	525	2,813	527	1,806	2,429	12,171	6,364
	Laundering, Cleaning and Dyeing Services	266,886	3,720	334,987	1,659	1,549	1,505	3,647	1,457	1,910	8,272	-2 =	21,671
	All Other Personal Services	347,837	3,751	351,006	1,719	1,908	1,785	3,488	1,355	1,864	8,752	12,169	22,929
	TOTAL					4,645							
73	Miscellaneous Repair Service	3 3,406	3,904	20,924	1,981	1,226	1,178	3,984	64	1,981[a]	4,820	24,441	9,026
	Business Services	485,555	5,254	276,078	2,535	3,251	1,758	4,457	847	2,114	9,626	-7,993 =	18,025
	Legal, Eng., and Misc. Professional Services	517,27[illegible]	7,547	220,447	3,125	4,592	1,956	7,025	755	2,574	15,684	16,448	29,369
	TOTAL					9,069							
74	Legal, Eng., and Misc. Professional Services											5,339 -4,805 = 534	
75	Automobile Repair Services and Garages	492,595	3,718	22,343	2,177	1,880	2,089	3,812	104	2,117[a]	8,190	7,913 -21 = 7,892	34,381
	Entertainment and Recreation Services	362,885	3,175	153,605	1,464	1,377	1,850	2,871	522	926	5,702	5,620	23,272
77	Medical and Other Health Services	779,523	4,700	1,703,083	2,405	7,760	3,947	3,965	8,561	2,426	36,419	22,703	68,679
	Educational Services, Private	305,870	4,008	475,493	1,573	1,974	2,577	3,234	2,788	1,249	11,816		22,282
	Welfare, Religious and Membership Organizations	452,877	3,659	354,818	1,825	2,305	1,766	3,190	1,304	1,726	7,884		14,868

a. No median given for Providence SMSA because of small number employed. National median used in calculation.

Table 72 - 77 -2

I-O Sector	Industry of the Employed	FICA Taxable Payroll 1st Q 1959 x 4 ($000,000)	US Totals 1st Q 1964 x 4 ($000,000)	FICA Taxable Payrolls 1st Q 1959 ($000)	Rhode Island 1st Q 1964 ($000)	FICA pay 1964/1959 U.S.	FICA pay 1964/1959 R.I.	Adjusted Growth 1958-1963	1963 Estimated Product Providence SMSA ($000)
72	Hotels and Lodging Places	1,146	1,614	681	1,057	1.408	1.552	42.8%	9,088
	Laundering, Cleaning and Dyeing Services	1,328	1,572	1,784	2,047	1.184	1.147	5.5%	22,863
	All Other Personal Services	1,008	1,361	880	1,362	1.350	1.548	42.4%	32,651
	TOTAL								
73	Miscellaneous Repair Services	529	751	452	734	1.420	1.624	49.4%	13,485
	Business Services	2,618	4,544	1,681	3,113	1.736	1.852	70.4%	30,715
	Legal, Eng., and Misc. Professional Services (part)	2,222	3,348	1,301	2,095	1.507	1.610	48.1%	43,495
	TOTAL								
74	Legal, Eng., and Misc. Professional Services (part)								
75	Automobile Repair Services and Garages	864	1,208	1,070	1,393	1.502	1.302	19.8%	41,188
76	Entertainment and Recreation Services	1,390	1,865	1,149	1,556	1.342	1.354	24.6%	28,097
77	Medical and Other Health Services	3,696	5,961	5,645	8,906	1.613	1.578	45.2%	99,722
	Educational Service, Private	1,404	2,627	2,936	4,956	1.871	1.688	55.3%	34,604
	Welfare, Religious and Membership Organizations	1,988	2,535	2,060	2,590	1.275	1.252	15.2%	17,128

deductions coverage in the industries and only part to a growth in income of persons working in the industries. Growth of product of the service sector in the National Income and Product Accounts from 1958 to 1963 was 39.1 percent while growth of wage and salary disbursements was 38.9 percent. We may, on this basis, estimate an 8.7 percent increase in FICA deductions coverage. While increases in coverage were not the same for each industry we have no basis for allocating the increase differentially. In the next to last column of Table 72-77-2 rates of growth for each of the eleven Population Census industries for Rhode Island have been computed assuming that the 8.7 percent increase in FICA deductions coverage applies to each industry and that the increase from First Quarter 1959 to First Quarter 1964 payrolls may be taken as representative of the 1958 to 1963 increase. The final column shows the estimate of 1963 product for each of the eleven Population Census industries. The total estimated production in 1963 for the Providence SMSA in the eleven Population Census industries--$373,936,000--is remarkably close to the estimate for the state made from the data in Business Tax Returns of $364,?61,000, thus tending to confirm the overall accuracy of the estimates for service industries.

These estimates were revised when necessary for those industries or sectors which are covered by the Census of Business. Details are given in the discussion of the sector involved.

I-O 72 Hotels; Personal and Repair Services except Auto

SIC 70 Hotels, Rooming Houses, Camps and Other Lodging Places
SIC 72 Personal Services
SIC 76 Miscellaneous Repair Services except SIC 7694 Armature Rewinding Shops and SIC 7699 Repair Shops and Related Services, n.e.c.

SIC 70 - SIC 701, 703 Hotels, Motels, Tourist Courts, Trailer Parks and Camps.

The Census of Business reports total receipts for the SMSA of $9,811,000 for 1963. This includes receipts from meals and beverages

including packaged goods and from other merchandise. SIC 702, 704 Rooming and Boarding Houses and Organization Hotels and Lodging Houses--no Census figures on receipts are available. Payroll for the First Quarter of 1964 was reported in County Business Patterns for the State of Rhode Island and for 702 for Providence County and for 704 for Washington County. For 702 only $16,000 out of $230,000 of payroll was outside Providence County. It was assumed that an equivalent amount of rooming and boarding house activity was carried on in the Massachusetts part of the SMSA. For 704 twelve of the fifteen enterprises were located in Washington County. These were probably fraternity and sorority houses at the University of Rhode Island which is outside the SMSA. The payroll for the rest of the state of $6,000 for 704 was assumed equivalent to that for the SMSA. Total payroll for SIC's 702 and 704 for the SMSA for the year 1963 were estimated at four times the First Quarter 1964 payroll or $944,000. This was converted to an estimate of receipts by using the ratio of payroll to receipt for SIC's 701 and 703 for the SMSA. This ratio would probably be unduly high were it not for the fact that there are a very large number of working proprietors in SIC 702 and probably considerable under reporting. The resulting estimate was $2,858,000 for 1963 receipts of SIC's 702 and 704.

SIC 72 - The Census of Business reports total receipts of $43,465,000 for the SMSA.

SIC 76 - Less SIC 7694 and SIC 7699 (old definition).

The Census of Business reports total receipts for SIC 76 of $12,357,000 for the SMSA of this total $5,830,000 is attributable to SIC 7694 and SIC 7699 (new definition) leaving a balance of $6,527,000. Data is not available to make the estimate of SIC 7699 on the basis of the old definition.

Similar figures for 1958 nationally show (thousands of dollars):

SIC 701, 703	3,923,756
SIC 702, 704	225,366[a]
SIC 72	7,422,006
SIC 76 less 7694 and 7699 (new definition)	1,096,526
	$12,667,654

a. First Quarter 1959 payroll (thousands of dollars) for SIC 702 was $10,864, and for SIC 704 was $5,751, a total of $16,615; the ratio of payroll to receipts for SIC's 701 and 703 for 1958 was 3.391.

This compiled national total exceeds the Sector 72 output of $12,171,000 shown in the 1958 table because of the inability to exclude in the comparable regional figures for 1963 the food and beverage sales of hotels, etc. On the other hand more of SIC 76 is excluded than should be because data for the correct breakdown is not available. A reduction factor of .961 was applied to the 1963 Providence SMSA data giving final estimate for the sector of $60,217,000.

This estimate replaces for this I-O sector the estimate developed from Population Census figures of $64,602,000.

I-O 73 Business Services

SIC 6541 Title Abstract Companies.

SIC 73 Miscellaneous Business Services except SIC 7361 Private Employment Agencies and SIC 7391 Research Development and Testing Laboratories.

SIC 7694 Armature Rewinding Shops.

SIC 7699 (1958 definition) Miscellaneous Repair Services.

SIC 81 Legal Services.

SIC 89 Miscellaneous Services except SIC 8921 Non-profit Educational and Scientific Research Agencies.

SIC 6541 Does not exist in Rhode Island.

SIC 73 Except SIC 7361 and 7391

This industry is covered by the Census of Business and reported in the Selected Services volume for Rhode Island in sufficient detail so that the only problem that arises is because the total receipts for the research and development part of SIC 7391 is suppressed because of disclosure. The figure is given for the state and this is used instead after adjusting for number of establishments in proportion. The resulting total receipts are $41,425,000. This is substantially higher than the figure developed from the Population Census data.

SIC 7694 and SIC 7699 (1958 definition)

In connection with I-O 72 this was estimated at $5,830,000 based on the new definition of SIC 7699. Data is not available to make the estimate on the old definition.

SIC 81 and SIC 89 except SIC 8921

The estimate developed from Population Census figures of $43,495,000 for Legal, Engineering and Miscellaneous Professional Services covers the SIC classifications 81 and 89 including SIC 8921 as well as SIC 7391. Output of SIC 7391 has been estimated at $1,199,000 for the SMSA. No estimate of SIC 8921 output can be made and it was not removed. The total for this part of the sector is thus $42,296,000.

The total output for I-O sector 73 is $89,551,000.

I-O 74 Research and Development

SIC 7391 Research, Development and Testing Laboratories.

In the 1958 OBE table most of the output of this industry is transferred in. The non-transferred output is exactly equal to the output reported for SIC 7391 in the Census of Business.

For the 1963 Providence SMSA output a figure was developed from the receipts reported for research and development laboratories in the State of Rhode Island by adjusting this figure in proportion

to the number of establishments since the Providence SMSA figure was suppressed to avoid disclosure. This gave an estimate of $399,000. For testing laboratories the SMSA figure was reported as $800,000.

Total output for the industry was thus estimated at $1,199,000.

I-O 75 Automobile Repair and Services

SIC 75 Automobile Repair Services and Garages

SIC 55 (part) Automobile Dealers, Service Receipts including parts and Accessories sold installed

SIC 75 - The Census of Business reports total receipts of all enterprises in the Providence SMSA for 1963 as $20,746,000.

SIC 55 part - Automotive dealers in the Providence SMSA who reported sales by broad merchandise lines covered 90.08 percent of total sales of such dealers and reported sales of parts and accessories totaling $15,670,000 and non-merchandise receipts of $6,388,000. Types of automotive dealers for which good sample information breaking the categories down covered $15,479,000 of the parts and accessories sales and $4,185,000 of the non-merchandise receipts.

The franchised car dealers reporting in detail sold $4,178,000 of parts and accessories installed in repair work and $686,000 of tires, batteries, and accessories most of which would be installed sales in establishments of this sort. The franchised car dealers reporting parts and accessories in detail reported 75.55 percent of reported sales by such dealers. It is estimated that installed parts and accessories sales of all franchised car dealers was $6,447,000. Unfranchised car dealers sales of parts and accessories are not reported in order to avoid disclosure but can be determined by difference to be negligible. The tire, battery and accessory dealers reporting in detail sold $2,873,000 of batteries and tires to the user. In most such shops in this area these are generally sold installed while automobile accessories are sold for personal installation.

Enterprises reporting in detail accounted for 68.96 percent of sales by tire, battery, and accessory dealers so total installed sales of these dealers are estimated as $4,166,000. Total sales of parts installed by gasoline service stations was reported as $1,578,000 plus $2,036,000 of tires, batteries and accessories which are generally sold installed. For service stations reporting in detail these items covered 92.31 percent of reported sales of parts and accessories. Parts and accessories sold by all service stations reporting by broad merchandise lines amounted to $4,163,000. Since such stations reported 81.67 percent of all reported sales by service stations total sales of installed parts may be estimated at $4,705,000.

Service labor reported by franchised car dealers for whom non-merchandise receipts are reported in detail amounted to $3,787,000 or 92.14 percent of all non-merchandise receipts. Non-merchandise receipts of all car dealers reporting by broad merchandise lines were $5,726,000. Since such dealers reported 91.53 percent of all sales reported for car dealers we estimate non-merchandise receipts for all car dealers at $6,256,000 of which $5,764,000 is estimated to be for service labor. Service labor reported by gasoline service stations reporting in detail totaled $1,797,000 which was 91.54 percent of all non-merchandise receipts. Non-merchandise receipts of service stations reporting by broad merchandise lines were $2,144,000. Since such stations reported 81.67 percent of total sales reported by all service stations non-merchandise receipts for all service stations are estimated at $2,625,000 of which $2,403,000 is estimated to be service labor. For tire, battery and accessory dealers non-merchandise receipts are not divided in this same way. The total non-merchandise receipts are apparently for automotive services. Non-merchandise receipts of $541,000 are reported by enterprises reporting 85.67 percent of sales hence total non-merchandise receipts of tire, battery and accessory dealers are estimated at $631,000.

These estimates are tabulated in Table 75-1.

Table 75-1

CONTRIBUTIONS TO OUTPUT OF I-O 75 FROM RETAIL TRADE

	Installed Parts and Accessories	Labor Service
Car dealers	$6,447,000	$5,764,000
Tire, battery, accessory dealers	4,166,000	631,000
Gasoline service stations	4,705,000	2,403,000
TOTALS	$15,318,000	$8,798,000

The grand total of all contributions to output of I-O 75 from retail automotive dealers is estimated at $24,116,000.

Total output of the industry is estimated at $44,862,000 which exceeds the estimate based on the Population Census by 8.2 percent probably because many persons rendering such services are classified as employed in trade.

I-O 76 Amusements

SIC 78 Motion Pictures

SIC 79 Amusement and Recreation Services, except Motion Pictures

SIC 78 - Total receipts of enterprises classified in SIC 78 in the Providence SMSA for 1963 were reported in the Census of Business at $4,010,000.

SIC 79 - Total receipts of enterprises classified in SIC 79 were $21,249,000.

Pari-mutual receipts of the State are from two tracks, both of which are in the SMSA. The average 1963 and 1964 fiscal year receipts were $9,566,000.

The total of these three figures $34,825,000 was the output of the industry. No adjustments were made for rent and royalty receipts of the industry and no deduction for merchandise sales was attempted.

I-O 77 Medical, Educational Services and Non-Profit Organizations

SIC 0722 Veterinarians
SIC 7361 Employment Agencies
SIC 80 Health Services
SIC 82 Educational Services
SIC 84 Museums
SIC 86 Non-profit Organizations
SIC 8921 Non-profit Research Organizations

SIC 7361 is the only sector which can be dealt with separately. The 1963 Census of Business, Selected Services, reports receipts of these enterprises at $200,000 for the SMSA.

All other categories, except perhaps Veterinarians, should be included in the Population Census categories: Medical and Other Health Services, Educational Services, Private; and Welfare, Religious and Membership Organizations. In Table 72-77-2, an estimate of output for these categories was developed giving a total output of $151,454,000.

The overall total output for I-O 77 is thus $151,654,000.

I. GOVERNMENT ENTERPRISES

I-O 78 Federal Government Enterprises

Inasmuch as a very small portion of the national output of federal government enterprises originates in the Providence SMSA, no attempt has been made in this sector to duplicate the 1958 input-output figures of the Office of Business Economics. The 1963 national control output shown by the Jack Faucett Associates in their study, 1963 Output Measures for Input-Output Sectors by Standard Metropolitan Statistical Areas and Non-Metropolitan State Areas, has been accepted for the purposes of this study.

Only the following Post Office Department revenue and revenues associated with military bases could be considered as output of the federal government in the Providence SMSA.

Enterprise	1963 Output-Providence SMSA
Motion picture theatre operated by U.S. Department of Defense on military posts	$ 12,000
Commissaries, exchanges, and eating and drinking places operated for military personnel	7,976,000
U.S. Post Office Department	18,561,938
TOTAL	$26,561,938

The motion picture theatre receipts were reported by the U.S. Department of Commerce, Bureau of the Census, in the 1963 Census of Business, VII, Selected Services Area Statistics, part 3, page 41-19. The remaining sales on military bases were reported in the 1963 Census of Business, II, Retail Trade Area Statistics, part 3, page 41-22.

According to the Annual Report of the Postmaster General, 1964, page 142, the U.S. Post Office Department revenue and operating reimbursements for fiscal years 1963 and 1964 were $3,879,127,992 and $4,276,123,326 respectively. The above totals were averaged to take into account June 30th fiscal reporting dates. From this 1963 average revenue, $4,077,625,659, a per capita amount was calculated based upon the 1960 national census excluding armed forces abroad. The per capita figure, $22.65, was multiplied by the 1960 population located in the Providence SMSA to estimate the local output for this federal enterprise.

I-O 79 State and Local Government Enterprises

1. State Government Enterprises

a. The states' fiscal years ended on June 30, 1958 and June 30, 1963 for all but the following states: in 1958, Pennsylvania's fiscal year ended May 31; in 1958 and 1963, Alabama's fiscal year ended September 30; New York's on March 31 and Texas' on August 31. The national summaries of state output shown in this section, therefore, are weighted averages of the total 1958 and 1959 revenue statistics as reported in pamphlets published by the U.S. Department of Commerce, Bureau of the Census, Compendium of State Government Finances in 1958, 1959, 1963, and 1964.

b. The individual state revenues for Rhode Island and Massachusetts were also reported in the above mentioned compendia. These revenues were apportioned to the Providence SMSA in the following manner. Total highway toll facility revenue figures for 1963 and 1964 were averaged to take into account the states' mid-year fiscal date. These averaged totals were then distributed to the Providence SMSA on a percentage of population basis. No water transportation and terminal revenue nor air transportation facility revenue was assigned to the Massachusetts portion of the Providence SMSA. The entire state revenue of airport facilities in Rhode Island was included in the Rhode Island portion of the SMSA and a

proportionate amount, based upon the percentage of state population located therein, was so allocated.

2. Local Government Enterprises

a. The national output figures shown for local government enterprises were reported by the Bureau of the Census in the pamphlets, Compendium of City Government Finances in 1958 and 1963, except for the revenue listed below.

The operating revenue of publicly owned utilities, including resale revenue, as reported to the Federal Power Commission seemed the most accurate guide to the output of this portion of the industry sector. It is consistent with the electric utility output figures shown elsewhere in this study. The local figures shown, therefore, were obtained from the FPC - Statistics of Electric Utilities in the United States - Publicly Owned - 1958 and 1963.

Inasmuch as no specific current charge nor miscellaneous general revenue was listed for "other sanitary services" in 1958, this amount has been omitted from the table accompanying this section.

No specific amount was listed in the 1958 Compendium for local revenue resulting from off-street parking, etc. The figure shown in the table, therefore, is an estimate obtained by comparing unallocated local charges or miscellaneous revenue in the year 1958 with the unallocated amount plus the off-street parking revenue shown for 1963. The estimate shown is a percentage (62.5 percent) of the 1963 revenue.

b. In order to obtain the output of local government enterprises for the Providence SMSA consistent with the totals obtained on a national basis, similar sources were used.

The FPC reported a municipal electric utility operating revenue for the town of North Attleboro, Massachusetts of $856,902 in 1963. The 1962 operating utility revenue of the Pascoag Fire in

Burrilville, Rhode Island was reported by the Bureau of the Census to be $258,000. These were the only publicly owned electric utilities located within the Providence SMSA.

All other outputs shown on the table for this sector were calculated on the basis of statistics given in the 1962 Census of Governments, Volume V; Revenue and current charges were shown by state. Expenditures, other than capital outlay, were shown both by state and by SMSA. The expenditure amounts were given for both the Rhode Island and the Massachusetts portions of the Providence SMSA. By means of obtaining the percentage of revenue to expenditure by state, it was possible to estimate the revenue applicable to the SMSA. By multiplying the percentages so calculated times the expenditures, other than capital outlay, allocated to the two portions of the Providence SMSA, estimates of output for this area were derived.

3. The Office of Business Economics in the national I-O table for 1958 shows output for this sector as $4,784,000,000. As shown in the accompanying table, the 1958 total derived herein is $4,961,325,003, or 103.7 percent of the OBE figure. With few exceptions the SMSA output in this section is based upon 1962 census statistics. In lieu of expanding the 1962 census figures to reflect an increase in local government revenues from its own sources (107 percent increase in 1963 over 1962 in Rhode Island and a slight decrease, 99.6 percent in Massachusetts), it has been assumed that the difference in national output and the inclusion of "other sanitary services" in 1963 fully compensate for the increase in local government revenue in the Providence SMSA.

I-O 81 Business Travel, Entertainment and Gifts

I-O 82 Office Supplies

The output of these dummy industries is all obtained by transfer and is in turn all distributed as intermediate output to sectors from 1 through 79.

The survey information on purchases of products classified in these industries was extremely sketchy and offered no basis for estimating.

Both inputs and outputs were estimated by applying 1958 OBE coefficients to row totals. Division between production in the SMSA and imports was estimated by using the ratios developed for total inputs from each sector on survey responses.

I-O 83 Scrap, Used and Secondhand Goods

So little sale of scrap or use of purchased scrap was revealed on the survey responses that this industry was omitted. This sector was deemed too variable geographically to warrant estimation from national coefficients.

I-O 84 Government Industry

I-O 86 Household Industry

These industries show only a value added input which covers the earnings of persons employed in these industries. There are no imports. The output is in each case shown as going to the corresponding final demand sectors - Personal Consumption Expenditure, and Federal and State and Local Government Purchases.

Table 79

State and Local Government Enterprises	USA - 1958 State	USA - 1958 Local	USA - 1958 Total	USA - 1963 State	USA - 1963 Local	USA - 1963 Total	Providence SMSA - 1963 State	Providence SMSA - 1963 Local	Providence SMSA - 1963 Total
I. Utility Revenue	----	----	----	----	----	----	----	----	----
A. Water Supply System	----	$1,237,000,000	$1,237,000,000	----	$1,865,000,000	$1,865,000,000	----	$ 7,969,000	$ 7,969,000
B. Electric Power System	----	701,357,493	701,357,493	----	1,298,890,000	1,298,890,000	----	1,114,902	1,114,902
C. Gas Supply System	----	175,000,000	175,000,000	----	242,000,000	242,000,000	----	----	----
D. Transit System	----	522,000,000	522,000,000	----	639,000,000	639,000,000	----	----	----
II. Liquor Store Revenue	$1,070,947,990	112,000,000	1,182,947,990	$1,177,632,250	155,000,000	1,332,632,250	----	----	----
III. Water transportation and terminals	31,420,250	----	----	46,695,250	119,000,000	165,695,250	71,058	278,586	349,644
IV. Air Transportation Facilities	4,220,800	220,000,000 ----	255,641,050 ----	13,889,180	216,000,000	229,889,180	368,500	174	368,674
V. Highway Toll Facilities	287,628,470	----	287,628,470	454,813,240	----	454,813,240	1,187,840	----	1,187,840
VI. Sanitation	----	----	----	----	----	----	----	----	----
A. Sewerage	----	226,000,000	226,000,000	----	470,000,000	470,000,000	----	792,414	792,414
B. Other Sanitary Services	----	----	----	----	163,000,000	163,000,000	----	120,120	120,120
VII. Low Cost Housing and Urban Renewal	----	280,000,000	280,000,000	8,000,000	446,000,000	454,000,000	----	2,347,779	2,347,779
VIII. Off Street Parking	----	93,750,000	93,750,000	----	150,000,000	150,000,000	----	326,690	326,690
TOTAL	1,394,217,510	3,567,107,493	4,961,325,003	1,701,029,920	5,763,890,000	7,464,919,920	1,627,398	12,949,665	14,577,063

Methods Used in Developing Input-Output Tables for the Providence Standard Metropolitan Statistical Area, 1963 by Caleb A. Smith, UNCLASSIFIED, Institute for Defense Analyses, October 1967, Volume I - 145 pages, (Contract OCD PS 66 113).

Abstract

This working paper details the interindustry relations in the Providence-Pawtucket-Warwick, Rhode Island-Massachusetts, Standard Metropolitan Statistical Area (SMSA) for the year 1963 in the form of input-output tables. The two volumes of this paper describe how these regional tables having the same sectors as the national table published by the Office of Business Economics can be compiled.

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